START

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ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 140181

2. To: (Receiving Organization)	3. From: (Originating Organization)	4. Related EDT No.:
Distribution	100 Area Remedial Investigation	N/A
5. Proj./Prog./Dept./Div.:	**6. Cog. Engr.:**	**7. Purchase Order No.:**
100-HR-1/100 Area RI/ERE/RR	J. M. Ayres	N/A
8. Originator Remarks:		**9. Equip./Component No.:**
Transmitted for Release		N/A
		10. System/Bldg./Facility:
		N/A
11. Receiver Remarks:		**12. Major Assm. Dwg. No.:**
		N/A
		13. Permit/Permit Application No.:
		N/A
		14. Required Response Date:
		N/A

MAR 1993 RECEIVED EDMC

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev. No.	(E) Title or Description of Data Transmitted	(F) Impact Level	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	WHC-SD-EN-TI-082		0	Data Validation Report for the 100-HR-1 Operable Unit Vadose Borehole	3Q	1/2	1	

16. KEY

Impact Level (F)	Reason for Transmittal (G)	Disposition (H) & (I)
1, 2, 3, or 4 (see MRP 5.43)	1. Approval 4. Review 2. Release 5. Post-Review 3. Information 6. Dist. (Receipt Acknow. Required)	1. Approved 4. Reviewed no/comment 2. Approved w/comment 5. Reviewed w/comment 3. Disapproved w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)

(G) Reason	(H) Disp.	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp.
1	1	Cog.Eng.	J. M. Ayres	3/9/93	H6-02	EDMC (2)			H6-08	3	
1	1	Cog. Mgr.	R. P. Henckel	3/9/93	H6-02	Central Files (2)			L8-04		
1	1	QA	G. S. Carrigan	3/9/93	H4-16	ERC			H6-07		
		Safety									
		Env.									

18. J. M. Ayres — Signature of EDT Originator — Date 3/9/93

19. Authorized Representative for Receiving Organization — Date

20. R. P. Henckel — Cognizant/Project Engineer's Manager — Date 3/9/93

21. DOE APPROVAL (if required) Ltr. No.
[ ] Approved
[ ] Approved w/comments
[ ] Disapproved w/comments

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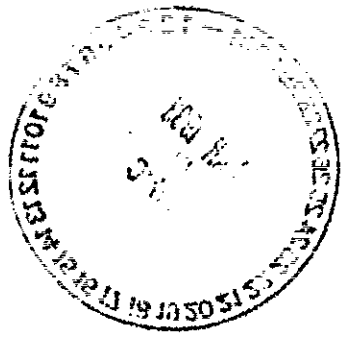

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SUPPORTING DOCUMENT

SUPPORTING DOCUMENT			1. Total Pages 151
2. Title Data Validation report for the 100-HR-1 Operable Unit Vadose Borehole		3. Number WHC-SD-EN-TI-082	4. Rev No. 0
5. Key Words Volatile organics, Semivolatile organics, Gross alpha, Gross beta, Pesticides/PCB APPROVED FOR PUBLIC RELEASE		6. Author Name: J. M. Ayres [illegible] 2/9/93 Signature Organization/Charge Code 81310/P711F	

7. Abstract 2/24/93 D. Solis

WHC, 1993, *Data Validation Report for the 100-HR-1 Operable Unit Vadose Borehole*, WHC-SD-EN-TI-082, Rev. 0, prepared by A. T. Kearney, Inc. for Westinghouse Hanford Company, Richland, Washington.

9. Impact Level 3Q

10. RELEASE STAMP

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ACRONYMS

%D	Percent difference
AA	Atomic absorption
BFB	Bromofluorobenzene
BNA	Base/neutral and acid (equivalent to semi-volatiles)
CCV	Continuing calibration verification
CLP	Contract Laboratory Program
CRDL	Contract required detection limit
CRQL	Contract required quantitation limit
DBC	Dibutylchlorendate
DFTPP	Decafluorotriphenylphosphine
DQO	Data quality objectives
EPA	U.S. Environmental Protection Agency
GC/MS	Gas chromatography/mass spectrometry
GC	Gas chromatography
GFAA	Graphite furnace atomic absorption
GPC	Gel permeation chromatography
ICP	Inductively coupled plasma emission spectrometry
ICS	ICP interference check sample
ICV	Initial calibration verification
IDL	Instrument detection limit
MSA	Method of standard addition
MS/MSD	Matrix spike/matrix spike duplicate
PCB	Polychlorinated biphenyl
PEM	Performance evaluation mixture
QA	Quality assurance
QC	Quality control
RF	Response factor
RIC	Reconstructed ion chromatogram
RPD	Relative percent difference
RRF	Relative response factor
RRT	Relative retention time
RSD	Relative standard deviation
RT	Retention time
SDG	Sample delivery group
SOW	Statement of work
TAL	Target analyte list
TCL	Target compound list
TIC	Tentatively identified compounds
TOC	Total organic carbon
TOX	Total organic halides
VOC	Volatile organic compounds

CONTENTS

1.0	INTRODUCTION	1-1
2.0	VOLATILE ORGANIC DATA VALIDATION	2-1
3.0	SEMI-VOLATILE DATA VALIDATION	3-1
4.0	PESTICIDE AND PCB DATA VALIDATION	4-1
5.0	INORGANIC DATA VALIDATION	5-1
6.0	GROSS ALPHA AND GROSS BETA DETERMINATION DATA VALIDATION	6-1
7.0	ALPHA SPECTROSCOPY DATA VALIDATION	7-1
8.0	GAMMA SPECTROSCOPY DATA VALIDATION	8-1
9.0	STRONTIUM-90 DETERMINATION DATA VALIDATION	9-1
10.0	TECHNETIUM-99 DATA VALIDATION	10-1
11.0	CARBON-14 DETERMINATION DATA VALIDATION	11-1
12.0	TRITIUM DETERMINATION DATA VALIDATION	12-1
13.0	REFERENCES	13-1

1.0 INTRODUCTION

Data from the chemical analysis of twenty-three samples from the 100-HR-1 Operable Unit Vadose Borehole Remedial Investigation and their related quality assurance samples were reviewed and validated. The validation was performed to verify that data quality objectives were met for reported sample results and to support decisions regarding remedial actions performed on site. The samples were analyzed by Thermo-Analytic Laboratories (TMA) and Roy F. Weston Laboratories (WESTON) using U.S. Environmental Protection Agency (EPA) CLP protocols.

Sample analyses included:

- Volatile organics
- Semi-volatile organics
- Pesticide/PCB organics
- Inorganics.

SDG Package No.	Matrix	No. of Samples Analyzed	Parameters
B05WN8	Soil	9	VOC, BNA, Pest/PCB
B05WN8	Water	1	VOC, BNA, Pest/PCB
B05WN8	Soil	4	Inorganics
B05WP1	Soil	5	Inorganics
B05WP1	Water	1	Inorganics
B05WP5	Soil	2	VOC, BNA, Pest/PCB, Inorganics
B05WP5	Water	2	VOC, BNA, Pest/PCB, Inorganics
B05WV6	Soil	6	VOC, BNA, Pest/PCB, Inorganics
B05WV7	Soil	1	VOC, BNA, Pest/PCB, Inorganics
B05WW6	Soil	2	VOC, BNA, Pest/PCB, Inorganics

Twenty-two of the samples were analyzed for radiochemical parameters by Teledyne Isotopes and TMA. Analytical protocols specified in the *Westinghouse Hanford Company Statement of Work for Nonradioactive Inorganic/Organic and Radiochemical Analytical Services* were used. Sample analyses included the following:

- Gross alpha and gross beta determination
- Alpha spectroscopy
- Gamma spectroscopy
- Strontium-90
- Technetium-99
- Carbon-14
- Tritium.

SDG Package No.	Matrix	No. of Samples Analyzed	Parameters
B05WN8	Soil	19	Radiochemical
B05WN8	Water	2	Radiochemical
B05WV7	Soil	1	Radiochemical

All data except SDG No. B05WV7 were analyzed by TMA. The samples in SDG No. B05WV7 were analyzed by Weston and Teledyne Isotopes. Data quality was reviewed and analytical results validated using Westinghouse Hanford Company (Westinghouse Hanford) procedures and related EPA CLP protocols and guidelines. Data were qualified based upon their quality and the guidance provided by these sources. In instances where the two protocols differed, the Westinghouse Hanford guidelines were followed.

Samples numbers B05WW6 and B05WW7 were field duplicate samples analyzed by TMA. Sample numbers B05WV6 and B05WV7 were field splits analyzed by TMA and Weston, respectively. Sample results were compared for their accuracy using the sample guidelines followed for determining the RPD between a sample and its duplicate. All results fell within the required control limits for all organic and inorganic parameters with the exception of barium and potassium results for the field duplicate samples and chromium and lead for the field split samples.

The report is broken down into sections for each chemical and radiochemical analysis type. Each section addresses the data package completeness, holding time adherence, instrument calibration and tuning acceptability, blank results, accuracy, precision, system performance, as well as the compound identification and quantitation. In addition, each section has an overall assessment and summary for the data packages reviewed. Detailed backup information is provided to the reader by SDG and sample number. For each SDG, a matrix of chemical analysis per sample number is presented, as well as data qualification summaries.

The radiochemical data summary tables can be found at the end of Section 12.0.

Laboratory and data validation personnel added qualifiers to the reported data based on specified data quality objectives. The data reporting qualifiers are summarized as follows:

U - Indicates the analyte was analyzed for and not detected. The value reported is the sample quantitation limit corrected for dilutions and moisture content. It should be noted that the sample quantitation limit may be higher or lower than the contract or method required detection limit, depending on instrumentation, matrix and concentration factors.

J - Indicates the analyte was analyzed for and detected. However, the associated value is considered to be an estimate due to identified QC deficiencies. Data flagged with a "J" may be usable for decision making purposes, depending upon the DQOs of the project. Laboratories qualify all reported organic detects below CRQL with a "J" per the CLP procedures.

UJ - Indicates the analyte was analyzed for and not detected. However, the associated detection limit is considered to be an estimate due to identified QC deficiencies. Detection limits flagged with a "UJ" may be usable for decision making purposes, depending upon the DQOs of the project.

JN - Indicates the analyte was analyzed for and there is presumptive evidence of that the compound is present. The concentration reported is considered an estimate which should be used for informational purposes only.

E - Indicates the analyte was analyzed for and detected at a concentration outside of the calibration range of the instrument. All reported concentrations flagged with an "E" are estimates which may contain significant error.

R - Indicates the analyte was analyzed for and due to a significant QC deficiency, the data is deemed unusable. Analytic results flagged "R" are invalid and provide no information as to whether or not the analyte is present.

The results of data validation performed for the 100-HR-1 Operable Unit Remedial Investigation are contained in the tables following each of the chapters in this report.

Several general quality trends which resulted in data qualification were observed. These included:

- Minor blank contamination was noted in the volatile and semi-volatile results for several samples. The contaminants

were compounds commonly found in analytical laboratories and the corresponding sample results were flagged accordingly.

- The fourteen-day holding time requirement for volatiles analysis was exceeded for one sample. All associated results were flagged accordingly.

- The holding time from extraction to analysis was exceeded, though not grossly for samples in several BNA and pesticide/PCB data packages.

- Continuing calibration recovery results did not meet the QC limits for several compounds in the volatiles and semi-volatiles analyses. The associated samples were flagged "J".

- The metal analysis showed repeated matrix spike accuracy problems, duplicate analyses precision results outside of QC, ICP serial dilution results outside of QC and analytical spike recoveries below the QC limit. Approximately one third of the metals results were flagged "J" due to these factors.

- Blank contamination noted in the inorganics analysis was generally from compounds found in analytical laboratories. Associated results were flagged accordingly.

- All gross alpha results were rejected due to low efficiency results determined in the calibrations.

- Alpha spectroscopy data were rejected in SDG No. B05WV7 due to low radiometric yields.

In general, the protocol-specific QA/QC requirements were met for the samples analyzed in this investigation with the exceptions noted above and discussed in detail in the chapters to follow. All requested analyses were performed.

With the exceptions noted above, the protocol-specific data quality objectives in terms of precision, accuracy, completeness, representativeness, and comparability have been met.

WELL AND SAMPLE INFORMATION				SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	VOLATILES
116-H-9	B05WN8	S	2/26/92	2-6
	B05WN9	S	2/27/92	2-6
	B05WP0	S	2/27/92	2-6
116-H-3	B05WP1	S	3/04/92	2-6
	B05WP5	S	3/05/92	2-11
	B05WP6	W	3/05/92	2-12
	B05WP7	W	3/05/92	2-12
116-H-7	B05WT8	S	2/27/92	2-6
	B05WT9	S	2/28/92	2-6
	B05WV1	W	2/28/92	2-7
	B05WV2	S	3/02/92	2-6
	B05WV3	S	3/02/92	2-6
	B05WV4	S	3/02/92	2-6
116-H-1	B05WV5	S	3/09/92	2-11
	B05WV6	S	3/09/92	2-11
	B05WV7	S	3/09/92	2-19
	B05WV8	S	3/09/92	2-11
	B05WV9	S	3/10/92	2-11
	B05WW0	S	3/10/92	2-11
	B05WW4	S	3/11/92	2-11
116-H-2	B05WW5	S	3/13/92	2-11
	B05WW6	S	3/16/92	2-22
	B05WW7	S	3/16/92	2-22

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2.0 VOLATILE ORGANIC DATA VALIDATION

2.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted and found to be complete:

B05WN8 B05WP5 B05WV6 B05WV7 B05WW6

2.2 HOLDING TIMES

Analytical holding times were assessed to ascertain whether the Westinghouse holding time requirements for volatile organic analyses were met by the laboratory. The Westinghouse holding time requirements for volatile organic analyses are as follows: soil samples must be analyzed within 14 days of the date of sample collection; aqueous samples must be analyzed within seven days of the date of sample collection (if unpreserved); and all samples must be shipped on ice to the laboratory and stored at 4°C until analysis.

The 14 day holding time was exceeded, though not grossly, for sample number B05WT8 in SDG No. B05WN8.

All other analyses were performed within the required holding times.

2.3 INSTRUMENT CALIBRATION AND TUNING

Instrument calibration is performed to establish that the GC/MS instrument is capable of producing acceptable and reliable analytical data over a range of concentrations. The initial and continuing calibrations are to be performed according to CLP protocols. An initial multipoint calibration is performed prior to sample analysis to establish the linear range of the GC/MS instrument. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All initial calibration results were acceptable.

The %Ds for the continuing calibrations did not meet QC limits for the following compounds. All of the associated samples were flagged as estimates (J):

- Bromomethane, acetone and bromoform in sample numbers B05WP6 and B05WP7 in SDG No. B05WP5.

All other continuing calibration results were acceptable.

2.3.1 GC/MS Tuning/Instrument Performance Check

Tuning is performed to ensure that mass resolution, identification, and, to some degree, sensitivity of the GC/MS instrument have been established. When analyzing for volatile organics, instrument tuning is performed with BFB. Instrument tuning must be performed prior to the analysis of either standards or samples and must meet the criteria for acceptable GC/MS instrument tuning using BFB as outlined in Westinghouse Hanford (WHC 1991) and in EPA (EPA 1988a and 1988b) criteria.

The original data were checked for transcription and calculation errors to verify that tuning criteria were met. Prior to calibration and sample analysis, all tuning criteria were met.

All GC/MS tuning data is acceptable.

2.4 BLANKS

Method blank and field blank analyses are performed to determine the extent of laboratory or field contamination of samples. No contaminants should be present in the blanks. Analytical results for analytes present in any sample at less than 5 times the concentration of that analyte found in associated blanks should be qualified as non-detects; common laboratory contaminants present at less than 10 times the concentration of that analyte are qualified as non-detects.

Due to the presence of laboratory blank contamination the following samples were flagged "U" for acetone:

- Sample numbers B05WN3, B05WN9, B05WP0, B05WP1, B05WT9, B05WV2, and B05WV4 in SDG No. B05WN8.
- Sample numbers B05WP5 and B05WV5 in SDG No. B05WP5.
- Sample numbers B05WV6, B05WV8, B05WV9, B05WW4 and B05WW5 in SDG No. B05WV6.
- Sample number B05WW6 in SDG No. B05WW6.

Due to the presence of laboratory blank contamination the following samples were flagged "U" for methylene chloride:

- Samples numbers B05WN8 and B05WP1 in SDG No. B05WN8.

- Sample numbers B05WP5 and B05WV5 in SDG No. B05WP5.
- All samples associated with SDG No. B05WV6.
- Sample number B05WV7 in SDG No. B05WV7.

All other laboratory blank results were acceptable.

2.5 ACCURACY

Accuracy was assessed by evaluating the recoveries of stable isotopically labeled surrogate compounds added to all samples and blanks, and by the analysis of a representative sample which was spiked with a variety of volatile organic compounds.

2.5.1 Matrix Spike Recovery

Matrix spike compounds are added to a sample which is representative of the sample delivery group. Matrix spike analyses are performed in duplicate using five compounds and should be within the established quality control limits (EPA 1988b). The matrix spike analyses estimate how much the target compounds are interfered with, either positively or negatively, by the sample matrix.

All MS/MSD results were acceptable.

2.5.2 Surrogate Recovery

Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates (J). Undetected compounds are qualified as having an estimated detection limit (UJ).

All surrogate recovery results are acceptable.

2.6 PRECISION

Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. Field precision is measured by analyzing duplicate samples taken in the field.

All matrix spike/matrix spike duplicate RPD results were acceptable.

2.7 INTERNAL STANDARDS PERFORMANCE

Internal standard performance was assessed to determine whether abrupt changes in instrument response and sensitivity occurred that may have affected the reliability of the analytical data. The response (area or height) of the internal standards must not vary by more than 100 percent or -50 percent from the response of the internal standard that was used to calculate the upper and lower bounds. The upper and lower bounds define the range for acceptable internal standard response (area/height) for the sample analyses.

All internal standard recovery results were acceptable.

2.8 COMPOUND IDENTIFICATION AND QUANTITATION

The identity of detected compounds was confirmed to investigate the possibility of false positives. The confirmation of compound identification during the quality assurance review focuses on false positives because only mass spectra for positive identifications are submitted. However, target compounds that are reported as undetected are also evaluated to investigate the possibility of false negatives. Confirmation of possible false negatives is addressed by reviewing other factors relating to analytical sensitivity (e.g., relative response factors, detection limits, linearity, analytical recovery).

Compound quantitations and reported detection limits were recalculated for a minimum of 20 percent of the samples in each case to verify that they are accurate and are consistent with CLP requirements.

Below the CRQL, instrument precision becomes more variable as the instrument detection limit is approached. Therefore, the concentration of any compound that was detected below the CRQL was qualified as an estimate (J).

The reported results and quantitation limits were verified as correct in all cases.

2.9 OVERALL ASSESSMENT AND SUMMARY

A thorough review of ongoing data acquisition and instrument performance criteria was made to assess overall GC/MS instrument performance. No changes in instrument performance were noted that would result in the degradation of data quality. No indications of unacceptable instrument performance (i.e., shifts

in baseline stability, retention time shifts, extraneous peaks, or sensitivity) were found during the quality assurance review.

In general, the volatile data presented in this report met the protocol-specified QA/QC requirements. Minor blank contamination was detected in the samples. The fourteen-day holding time requirement was not met for one sample. All associated results were qualified as estimates and flagged "J". Several compounds did not meet the QC limits for continuing calibrations; all associated samples were qualified as estimates. The data is considered valid and usable within the standard error associated with the method. All other results are considered to be acceptable and usable for all purposes.

VOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case:	SDG: B05WN8																				
Sample Number		B05WN8		B05WN9		B05WP0		B05WP1		B05WT8		B05WT9		B05WV2		B05WV3		B05WV4			
Location		116-H-9		116-H-9		116-H-9		116-H-3		116-H-7		116-H-7		116-H-7		116-H-7		116-H-7			
Remarks																					
Sample Date		02/26/92		02/27/92		02/27/92		03/04/92		02/27/92		02/28/92		03/02/92		03/02/92		03/02/92			
Analysis Date		03/11/92		03/11/92		03/11/92		03/10/92		03/13/92		03/11/92		03/11/92		03/11/92		03/11/92			
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Chloromethane	10	11	U	10	U	10	U	10	U	11	UJ	11	U	11	U	11	U	10	U		
Bromomethane	10	11	U	10	U	10	U	10	U	11	UJ	11	U	11	U	11	U	10	U		
Vinyl Chloride	10	11	U	10	U	10	U	10	U	11	UJ	11	U	11	U	11	U	10	U		
Chloroethane	10	11	U	10	U	10	U	10	U	11	UJ	11	U	11	U	11	U	10	U		
Methylene Chloride	10	14	U	16	U	10	U	10	U	11	UJ	14	U	13	U	22	U	10	U		
Acetone	10	19	U	35	U	20	U	33	U	11	UJ	31	U	41	U	36	U	23	U		
Carbon Disulfide	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
1,1-Dichloroethene	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
1,1-Dichloroethane	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
1,2-Dichloroethene (total)	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
Chloroform	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
1,2-Dichloroethane	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
2-Butanone	10	11	U	10	U	10	U	10	U	11	UJ	11	U	11	U	11	U	10	U		
1,1,1-Trichloroethane	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
Carbon Tetrachloride	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
Vinyl Acetate	10	11	U	10	U	10	U	10	U	11	UJ	11	U	11	U	11	U	10	U		
Bromodichloromethane	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
1,2-Dichloropropane	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
cis-1,3-Dichloropropene	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
Trichloroethene	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
Dibromochloromethane	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
1,1,2-Trichloroethane	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
Benzene	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
trans-1,3-Dichloropropene	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
Bromoform	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
4-Methyl-2-pentanone	10	11	U	10	U	10	U	10	U	11	UJ	11	U	11	U	11	U	10	U		
2-Hexanone	10	11	U	10	U	10	U	10	U	11	UJ	11	U	11	U	11	U	10	U		
Tetrachloroethene	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
1,1,2,2-Tetrachloroethane	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
Toluene	10	5	U	3	U	5	U	2	U	2	UJ	49		5	U	3	J	5	U		
Chlorobenzene	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
Ethylbenzene	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
Styrene	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		
Xylene (total)	10	5	U	5	U	5	U	5	U	5	UJ	5	U	5	U	5	U	5	U		

VOLATILE ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case:	SDG: B05WN8																		
Sample Number		B05WV1																	
Location		116-H-7																	
Remarks		EB																	
Sample Date		02/28/92																	
Analysis Date		03/06/92																	
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U																		
Bromomethane	10	10	U																		
Vinyl Chloride	10	10	U																		
Chloroethane	10	10	U																		
Methylene Chloride	10	10	U																		
Acetone	10	3	J																		
Carbon Disulfide	10	5	U																		
1,1-Dichloroethene	10	5	U																		
1,1-Dichloroethane	10	5	U																		
1,2-Dichloroethene (total)	10	5	U																		
Chloroform	10	5	U																		
1,2-Dichloroethane	10	5	U																		
2-Butanone	10	10	U																		
1,1,1-Trichloroethane	10	5	U																		
Carbon Tetrachloride	10	5	U																		
Bromodichloromethane	10	10	U																		
1,2-Dichloropropane	10	5	U																		
cis-1,3-Dichloropropene	10	5	U																		
Trichloroethene	10	5	U																		
Dibromochloromethane	10	5	U																		
1,1,2-Trichloroethane	10	5	U																		
Benzene	10	5	U																		
trans-1,3-Dichloropropene	10	5	U																		
Bromoform	10	5	U																		
4-Methyl-2-pentanone	10	10	U																		
2-Hexanone	10	10	U																		
Tetrachloroethene	10	5	U																		
1,1,2,2-Tetrachloroethane	10	5	U																		
Toluene	10	1	J																		
Chlorobenzene	10	5	U																		
Ethylbenzene	10	5	U																		
Styrene	10	5	U																		
Xylene (total)	10	5	U																		

EB = Equipment Blank

HOLDING TIME SUMMARY

SDG: B05WN8	REVIEWER: MY			DATE: 10/26/92		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B05WT8	VOA	2/27/92		3/13/92		14	J

BLANK AND SAMPLE DATA SUMMARY

SDG: B05WN8	REVIEWER: MY			DATE: 10/26/92				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
VBLK0310R3	Methylene chloride	7			ug/kg	35	70	B05WP1	U
VBLK0310R3	Acetone	26			ug/kg	130	260	B05WP1	U
VBLK0311R	Methylene chloride	3	J		ug/kg	15	30	B05WN8	U
VBLK0311R	Acetone	15			ug/kg	75	150	B05WN9, B05WP0, B05WT9, B05WV2, B05WN3, B05WV4	U

DATA QUALIFICATION SUMMARY

SDG: B05WN8	REVIEWER: MY	DATE: 10/26/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All VOA compounds	J	B05WT8	Holding time
Methylene chloride	U	B05WP1 and B05WN8	Lab blank contamination
Acetone	U	B05WN9, B05WP0, B05WT9, B05WV2, B05WN3, B05WV1 and B05WP1	Lab blank contamination

VOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case:	SDG: B05WP5																				
Sample Number		B05WP5		B05WV5																	
Location		116-H-3		116-H-2																	
Remarks																					
Sample Date		3/05/92		3/09/92																	
Analysis Date		3/12/92		3/13/92																	
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	11	U																
Bromomethane	10	10	U	11	U																
Vinyl Chloride	10	10	U	11	U																
Chloroethane	10	10	U	11	U																
Methylene Chloride	10	5	U	11	U																
Acetone	10	10	U	13	U																
Carbon Disulfide	10	5	U	5	U																
1,1-Dichloroethene	10	5	U	5	U																
1,1-Dichloroethane	10	5	U	5	U																
1,2-Dichloroethene (total)	10	5	U	5	U																
Chloroform	10	5	U	5	U																
1,2-Dichloroethane	10	5	U	5	U																
2-Butanone	10	10	U	11	U																
1,1,1-Trichloroethane	10	5	U	5	U																
Carbon Tetrachloride	10	5	U	5	U																
Vinyl Acetate	10	10	U	11	U																
Bromodichloromethane	10	5	U	5	U																
1,2-Dichloropropane	10	5	U	5	U																
cis-1,3-Dichloropropene	10	5	U	5	U																
Trichloroethene	10	5	U	5	U																
Dibromochloromethane	10	5	U	5	U																
1,1,2-Trichloroethane	10	5	U	5	U																
Benzene	10	5	U	5	U																
trans-1,3-Dichloropropene	10	5	U	5	U																
Bromoform	10	5	U	5	U																
4-Methyl-2-pentanone	10	10	U	11	U																
2-Hexanone	10	10	U	11	U																
Tetrachloroethene	10	5	U	5	U																
1,1,2,2-Tetrachloroethane	10	5	U	5	U																
Toluene	10	7		14																	
Chlorobenzene	10	5	U	5	U																
Ethylbenzene	10	5	U	5	U																
Styrene	10	5	U	5	U																
Xylene (total)	10	5	U	5	U																

VOLATILE ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case:	SDG: B05WP5																				
Sample Number		B05WP6		B05WP7																	
Location		116-H-3		116-H-3																	
Remarks		TB		EB																	
Sample Date		3/05/92		3/05/92																	
Analysis Date		3/13/92		3/13/92																	
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U																
Bromomethane	10	10	UJ	10	UJ																
Vinyl Chloride	10	10	U	10	U																
Chloroethane	10	10	U	10	U																
Methylene Chloride	10	10		7	J																
Acetone	10	10	UJ	10	UJ																
Carbon Disulfide	10	5	U	5	U																
1,1-Dichloroethene	10	5	U	5	U																
1,1-Dichloroethane	10	5	U	5	U																
1,2-Dichloroethene (total)	10	5	U	5	U																
Chloroform	10	2	J	2	J																
1,2-Dichloroethane	10	5	U	5	U																
2-Butanone	10	10	U	10	U																
1,1,1-Trichloroethane	10	5	U	5	U																
Carbon Tetrachloride	10	5	U	5	U																
Vinyl Acetate	10	10	U	10	U																
Bromodichloromethane	10	5	U	5	U																
1,2-Dichloropropane	10	5	U	5	U																
cis-1,3-Dichloropropene	10	5	U	5	U																
Trichloroethene	10	5	U	5	U																
Dibromochloromethane	10	5	U	5	U																
1,1,2-Trichloroethane	10	5	U	5	U																
Benzene	10	5	U	5	U																
trans-1,3-Dichloropropene	10	5	U	5	U																
Bromoform	10	5	UJ	5	UJ																
4-Methyl-2-pentanone	10	10	U	10	U																
2-Hexanone	10	10	U	10	U																
Tetrachloroethene	10	5	U	5	U																
1,1,2,2-Tetrachloroethane	10	5	U	5	U																
Toluene	10	2	J	1	J																
Chlorobenzene	10	5	U	5	U																
Ethylbenzene	10	5	U	5	U																
Styrene	10	5	U	5	U																
Xylene (total)	10	5	U	5	U																

CALIBRATION DATA SUMMARY

SDG: B05WP5	REVIEWER: MY		DATE: 2/03/93		PAGE 1 OF 1
COMMENTS:					
CALIB. TYPE:	INITIAL CONTINUING		INSTRUMENT:		
CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
3/13/92	Bromomethane	.538	%D 30.6	B05WP6,B05WP7	J
3/13/92	Acetone	.272	%D 29.7	B05WP6,B05WP7	J
3/13/92	Bromoform	.307	%D 25.6	B05WP6,B05WP7	J

BLANK AND SAMPLE DATA SUMMARY

SDG:B05WP5	REVIEWER: MY			DATE: 2/03/93				PAGE_1_OF_1_	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
VBLK0312R	Methylene chloride	6			ug/kg	30	60	B05WP5,B05WV5	U
VBLK0312R	Acetone	8			ug/kg	40	80	B05WP5,B05WV5	U

DATA QUALIFICATION SUMMARY

SDG: B05WP5	REVIEWER: MY	DATE: 2/03/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bromomethane	J	B05WP6,B05WP7	Calibration
Acetone	J	B05WP6,B05WP7	Calibration
Bromoform	J	B05WP6,B05WP7	Calibration
Methylene chloride	U	B05WP5,B05WV5	Blank Contamination
Acetone	U	B05WP59,B05WV5	Blank Contamiantion

VOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case:	SDG: B05WV6																		
Sample Number		B05WV6		B05WV8		B05WV9		B05WW0		B05WW4		B05WW5							
Location		116-H-1		116-H-1		116-H-1		116-H-1		116-H-1		116-H-2							
Remarks		Split																	
Sample Date		03/09/92		03/09/92		03/10/92		03/10/92		03/11/92		03/13/92							
Analysis Date		03/23/92		03/23/92		03/23/92		03/23/92		03/23/92		03/23/92							
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	11	U	11	U	10	U	11	U	10	U	10	U						
Bromomethane	10	11	U	11	U	10	U	11	U	10	U	10	U						
Vinyl Chloride	10	11	U	11	U	10	U	11	U	10	U	10	U						
Chloroethane	10	11	U	11	U	10	U	11	U	10	U	10	U						
Methylene Chloride	10	11	U	11	U	10	U	11	U	10	U	10	U						
Acetone	10	11	U	15	U	10	U	130		15	U	14	U						
Carbon Disulfide	10	5	U	5	U	5	U	5	U	5	U	5	U						
1,1-Dichloroethene	10	5	U	5	U	5	U	5	U	5	U	5	U						
1,1-Dichloroethane	10	5	U	5	U	5	U	5	U	5	U	5	U						
1,2-Dichloroethene (total)	10	5	U	5	U	5	U	5	U	5	U	5	U						
Chloroform	10	5	U	5	U	5	U	5	U	5	U	5	U						
1,2-Dichloroethane	10	5	U	5	U	5	U	5	U	5	U	5	U						
2-Butanone	10	11	U	11	U	10	U	11	U	10	U	10	U						
1,1,1-Trichloroethane	10	5	U	5	U	5	U	5	U	5	U	5	U						
Carbon Tetrachloride	10	5	U	5	U	5	U	5	U	5	U	5	U						
Vinyl Acetate	10	11	U	11	U	10	U	11	U	10	U	10	U						
Bromodichloromethane	10	5	U	5	U	5	U	5	U	5	U	5	U						
1,2-Dichloropropane	10	5	U	5	U	5	U	5	U	5	U	5	U						
cis-1,3-Dichloropropene	10	5	U	5	U	5	U	5	U	5	U	5	U						
Trichloroethene	10	5	U	5	U	5	U	5	U	5	U	5	U						
Dibromochloromethane	10	5	U	5	U	5	U	5	U	5	U	5	U						
1,1,2-Trichloroethane	10	5	U	5	U	5	U	5	U	5	U	5	U						
Benzene	10	5	U	5	U	5	U	5	U	5	U	5	U						
trans-1,3-Dichloropropene	10	5	U	5	U	5	U	5	U	5	U	5	U						
Bromoform	10	5	U	5	U	5	U	5	U	5	U	5	U						
4-Methyl-2-pentanone	10	11	U	11	U	10	U	11	U	10	U	10	U						
2-Hexanone	10	11	U	11	U	10	U	11	U	10	U	10	U						
Tetrachloroethene	10	5	U	5	U	5	U	5	U	5	U	5	U						
1,1,2,2-Tetrachloroethane	10	5	U	5	U	5	U	5	U	5	U	5	U						
Toluene	10	4	J	1	J	2	J	5	U	5	U	5	U						
Chlorobenzene	10	5	U	5	U	5	U	5	U	5	U	5	U						
Ethylbenzene	10	5	U	5	U	5	U	5	U	5	U	5	U						
Styrene	10	5	U	5	U	5	U	5	U	5	U	5	U						
Xylene (total)	10	5	U	5	U	5	U	5	U	5	U	5	U						

BLANK AND SAMPLE DATA SUMMARY

SDG: B05WV6	REVIEWER: SC			DATE: 10/26/92				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
VBLK0323R	Methylene chloride	8			ug/Kg	40	80	All	U
VBLK0323R	Acetone	8	J		ug/Kg	40	80	All except B05WW0	U

DATA QUALIFICATION SUMMARY

SDG: B05WV6	REVIEWER: SC	DATE: 10/26/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene chloride	U	All	Lab blank contamination
Acetone	U	All except B05WW0	Lab blank contamination

VOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case:	SDG: B05WV7																				
Sample Number		B05WV7																			
Location		116-H-1																			
Remarks		Split																			
Sample Date		03/09/92																			
Analysis Date		03/19/92																			
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U																		
Bromomethane	10	10	U																		
Vinyl Chloride	10	10	U																		
Chloroethane	10	10	U																		
Methylene Chloride	10	10	U																		
Acetone	10	12																			
Carbon Disulfide	10	5	U																		
1,1-Dichloroethene	10	5	U																		
1,1-Dichloroethane	10	5	U																		
1,2-Dichloroethene (total)	10	5	U																		
Chloroform	10	5	U																		
1,2-Dichloroethane	10	5	U																		
2-Butanone	10	10	U																		
1,1,1-Trichloroethane	10	5	U																		
Carbon Tetrachloride	10	5	U																		
Vinyl Acetate	10	10	U																		
Bromodichloromethane	10	5	U																		
1,2-Dichloropropane	10	5	U																		
cis-1,3-Dichloropropene	10	5	U																		
Trichloroethene	10	5	U																		
Dibromochloromethane	10	5	U																		
1,1,2-Trichloroethane	10	5	U																		
Benzene	10	5	U																		
trans-1,3-Dichloropropene	10	5	U																		
Bromoform	10	5	U																		
4-Methyl-2-pentanone	10	10	U																		
2-Hexanone	10	10	U																		
Tetrachloroethene	10	5	U																		
1,1,2,2-Tetrachloroethane	10	5	U																		
Toluene	10	5	U																		
Chlorobenzene	10	5	U																		
Ethylbenzene	10	5	U																		
Styrene	10	5	U																		
Xylene (total)	10	5	U																		

BLANK AND SAMPLE DATA SUMMARY

SDG: B05WV7	REVIEWER: SC			DATE: 10/26/92				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
VBLK	Methylene chloride	1	J		ug/kg	5	10	B05WV7	U

DATA QUALIFICATION SUMMARY

SDG: B05WV7	REVIEWER: SC	DATE: 10/26/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene chloride	U	B05WV7	Lab blank contamination

VOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case:	SDG: B05WW6																		
Sample Number		B05WW6		B05WW7															
Location		116-H-2		116-H-2															
Remarks		DUP		DUP															
Sample Date		03/16/92		03/16/92															
Analysis Date		03/27/92		03/27/92															
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U														
Bromomethane	10	10	U	10	U														
Vinyl Chloride	10	10	U	10	U														
Chloroethane	10	10	U	10	U														
Methylene Chloride	10	5	U	3	J														
Acetone	10	78	U	120															
Carbon Disulfide	10	5	U	5	U														
1,1-Dichloroethene	10	5	U	5	U														
1,1-Dichloroethane	10	5	U	5	U														
1,2-Dichloroethene (total)	10	5	U	5	U														
Chloroform	10	5	U	5	U														
1,2-Dichloroethane	10	5	U	5	U														
2-Butanone	10	10	U	10	U														
1,1,1-Trichloroethane	10	5	U	5	U														
Carbon Tetrachloride	10	5	U	5	U														
Vinyl Acetate	10	10	U	10	U														
Bromodichloromethane	10	5	U	5	U														
1,2-Dichloropropane	10	5	U	5	U														
cis-1,3-Dichloropropene	10	5	U	5	U														
Trichloroethene	10	5	U	5	U														
Dibromochloromethane	10	5	U	5	U														
1,1,2-Trichloroethane	10	5	U	5	U														
Benzene	10	5	U	5	U														
trans-1,3-Dichloropropene	10	5	U	5	U														
Bromoform	10	5	U	5	U														
4-Methyl-2-pentanone	10	10	U	10	U														
2-Hexanone	10	10	U	10	U														
Tetrachloroethene	10	5	U	5	U														
1,1,2,2-Tetrachloroethane	10	5	U	5	U														
Toluene	10	5	U	2	U														
Chlorobenzene	10	5	U	5	U														
Ethylbenzene	10	5	U	5	U														
Styrene	10	5	U	5	U														
Xylene (total)	10	5	U	5	U														

DUP = Duplicate

BLANK AND SAMPLE DATA SUMMARY

SDG: B05WW6	REVIEWER: SC			DATE: 10/26/92				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
VBLK0327R	Acetone	8	J		ug/kg		80	B05WW6	U

DATA QUALIFICATION SUMMARY

SDG: B05WW6	REVIEWER: SC	DATE: 10/26/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Acetone	U	B05WW6	Lab blank contamination

WELL AND SAMPLE INFORMATION				SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	SEMI-VOLATILES
116-H-9	B05WN8	S	2/26/92	3-7, 3-8
	B05WN9	S	2/27/92	3-7, 3-8
	B05WP0	S	2/27/92	3-7, 3-8
116-H-3	B05WP1	S	3/04/92	3-7, 3-8
	B05WP5	S	3/05/92	3-14, 3-15
	B05WP7	W	3/05/92	3-16, 3-17
116-H-7	B05WT8	S	2/27/92	3-7, 3-8
	B05WT9	S	2/28/92	3-7, 3-8
	B05WV1	W	2/28/92	3-9, 3-10
	B05WV2	S	3/02/92	3-7, 3-8
	B05WV3	S	3/02/92	3-7, 3-8
	B05WV4	S	3/02/92	3-7, 3-8
116-H-1	B05WV6	S	3/09/92	3-20, 3-21
	B05WV7	S	3/09/92	3-24, 3-25
	B05WV8	S	3/09/92	3-20, 3-21
	B05WV9	S	3/10/92	3-20, 3-21
	B05WW0	S	3/10/92	3-20, 3-21
	B05WW4	S	3/11/92	3-20, 3-21
116-H-2	B05WW5	S	3/13/92	3-20, 3-21
	B05WW6	S	3/16/92	3-30, 3-31
	B05WW7	S	3/16/92	3-30, 3-31

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3.0 SEMI-VOLATILE ORGANIC DATA VALIDATION

3.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted and found to be complete:

B05WN8 B05WP5 B05WV6 B05WV7 B05WW6

3.2 HOLDING TIMES

Analytical holding times were assessed to ascertain whether the holding time requirements for semi-volatile analyses were met by the laboratory. Westinghouse Hanford protocols require that samples be extracted within seven days of collection and be analyzed within 40 days of extraction (WHC 1991a).

Based upon Westinghouse Hanford data validation procedures, the seven day extraction holding time was exceeded for all of the soil samples in SDG Nos. B05WN8 and B05WP5, and sample numbers B05WV6, B05WV8, B05WV9, B05WW0 and B05WW4 in SDG No. B05WV6. These samples were flagged "J" and are considered to be estimated. However, these samples meet the requirements of EPA Data Validation Guidelines, which requires a fourteen day extraction holding time.

All holding time requirements for all other data packages were met.

3.3 INSTRUMENT CALIBRATION AND TUNING

3.3.1 GC/MS Tuning/Instrument Performance Check

Tuning is performed to ensure that mass resolution, and to some degree, sensitivity, of the GC/MS instrument has been established. When analyzing for semi-volatile organic compounds, the GC/MS is tuned using DFTPP. The GC/MS must be tuned prior to the analysis of either standards or samples, and tuning must meet the criteria established by the analytical protocol. The specific criteria for acceptable GC/MS tuning using DFTPP are outlined in Westinghouse Hanford procedures (WHC 1991) and in CLP protocols (EPA 1988a and 1988b).

As a part of data validation, the original tuning data were checked for transcription and calculation errors to verify that tuning and performance criteria were met.

All tuning and performance criteria were met.

3.3.2 Initial Calibration

The GC/MS instrument is calibrated to ensure that it is capable of producing acceptable and reliable analytical data over a range of concentrations. The initial and continuing calibrations are to be performed according to CLP protocols. An initial multipoint calibration is performed prior to sample analysis to establish the linearity range of the GC/MS instrument. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

Instrument response is established by the initial calibration when the RRFs for all target compounds are greater than or equal to 0.05 units. Linearity is established when the RSDs of the RRFs are less than or equal to 30 percent.

All initial calibration results were acceptable.

3.3.3 Continuing Calibration

The criteria for accepting the continuing calibration require that a standard be analyzed at least once per 12 hour period and that the RRFs of all target compounds be greater than or equal to 0.05 units. In addition, the percent difference of these RRFs must be less than or equal to 25 percent of the average RRFs calculated for the associated initial calibration.

The %Ds for the continuing calibrations did not meet QC limits for the following compounds. All of the associated samples were flagged as estimates (J):

- 3-nitroaniline, 4-nitroaniline, 3,3'-dichlorobenzidine, indeno(1,2,3-cd)pyrene and dibenzo(a,h)anthracene.

All other continuing calibration results were acceptable.

3.4 BLANKS

Method blank and field blank analyses are performed to determine the extent of laboratory or field contamination of samples. No contaminants should be present in the blanks. Analytical results for analytes present in any sample at less than 5 times the concentration of that analyte found in

associated blanks should be qualified as non-detects; in the case of certain common laboratory contaminants, results less than 10 times blank concentrations should be qualified as non-detects.

Due to the presence of di-n-butylphthalate in the laboratory blank, the following associated sample results for the above analyte were qualified as non-detects (U qualifier):

- Sample numbers B05WP1, B05WT8, B05WT9 and B05WV4 in SDG No. B05WN8.
- All samples associated with SDG No. B05WW6.

All other blank results were acceptable.

3.5 ACCURACY

Accuracy was assessed by evaluating the recoveries of stable isotopically labeled surrogate compounds added to all samples and blanks, and by the analysis of a representative sample which was spiked with a variety of organic compounds.

3.5.1 Matrix Spike Recovery

Matrix spike compounds are added to a sample which is representative of the sample delivery group. Matrix spike analyses are performed in duplicate using the 11 compounds specified by CLP protocols. All recoveries for the 11 compounds should be within the established QC limits (EPA 1988b). The matrix spike analyses estimate how much the analyses for the target compounds are interfered with, either positively or negatively, by the sample matrix. Because the matrix spike is performed using only one of the samples extracted with the SDG, these data alone cannot be used to evaluate the precision and accuracy of individual samples.

The matrix spike/matrix spike recoveries were out of specification for sample number B05WV7 in SDG No. B05WV7. Phenol was recovered at 15% and zero recoveries were reported for acenaphthene and pyrene. All associated results were flagged as estimates ("J").

All other matrix spike/matrix spike duplicate recovery results were acceptable in all cases.

3.5.2 Surrogate Recovery

Surrogate compound recoveries are calculated using analytical results from six stable, isotopically labeled surrogate compounds added to the sample prior to sample

preparation and analysis. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. When recoveries for any two surrogate compounds are out of the control window, all positively identified target compound concentrations in samples associated with the unacceptable surrogate recoveries are qualified as estimates (J) and undetected compounds are qualified as having an estimated detection limit (UJ).

All surrogate recovery results were acceptable.

3.6 PRECISION

The precision is expressed by the RPD between the recoveries of the matrix spike and the matrix spike duplicate analyses performed on a sample, and through a comparison of the results for field duplicate samples. Acceptable control windows for RPD for matrix spike/matrix spike duplicate analyses have been established by the EPA CLP program.

Field precision is measured by analyzing duplicate samples taken in the field. No standards have been established for qualifying data based on RPD for duplicate field samples by CLP protocols. Westinghouse Hanford procedures establish the following criteria for duplicate field sample analyses for organic compounds, based on criteria established for inorganic analyses for laboratory duplicates:

1. For compounds whose concentrations are greater than 5 times CRQL, RPDs, must be ±20 percent for aqueous samples and ±35 percent soil samples.

2. When one or more compounds are present at concentrations less than 5 times CRQL, the concentration difference must be ± CRQL for aqueous samples and ± CRQL for soil samples

The matrix spike/matrix spike duplicate RPD for phenol exceeded the QC limit for sample number B05WV7 in SDG No. B05WV7. All associated results were flagged as estimates ("J").

All other matrix spike/matrix spike duplicate RPDs results were acceptable.

3.7 SYSTEM PERFORMANCE

Internal standard performance was assessed to determine whether abrupt changes in instrument response and sensitivity occurred that may have affected the reliability of the analytical data. The response (area or height) of the internal standards must not vary by more than -50 percent or +100 percent from the

response of the calibration standard that was used to calculate the upper and lower bounds. The upper and lower bounds define the range for acceptable internal standard response (area/height) for the sample analyses. In addition, retention times for the internal standard must not vary more than ±30 seconds from that of the associated calibration standard.

All internal standard results were acceptable.

3.8 COMPOUND IDENTIFICATION AND QUANTITATION

The identities of detected compounds were confirmed to investigate the possibility of false positives. The confirmation of compound identification during the QA review focuses on false positives because only mass spectra for positive identifications are submitted. However, target compounds that are reported as undetected are also evaluated to investigate the possibility of false negatives. Confirmation of possible false negatives is addressed by reviewing other factors relating to analytical sensitivity (e.g., detection limits, linearity, analytical recovery). Compound retention times and mass spectra must match those for the standard within set to tolerance limits (EPA 1988b).

3.8.1 Reported Results and Quantitation Limits

Compound quantitations and reported detection limits were recalculated and verified to ensure that they are accurate and are consistent with the internal standards and relative retention times specified by the CLP scope of work.

At concentrations below the CRQL, instrument precision becomes more variable as the IDL is approached. Therefore, the concentrations of any compound detected below the CRQL are qualified as estimates.

All compound identifications and quantitations have been verified as correct.

3.8.2 Tentatively Identified Compounds

Several TICs were identified in the blanks and samples which were flagged "U" according to Westinghouse protocols; if the sample result was ±0.06 RRT from that of the blank and if the sample result was less than 5 times the highest blank concentration.

This action is contrary to EPA policy, which indicates that TIC results shown to be due to the presence of blank contamination are flagged "R."

3.9 OVERALL ASSESSMENT AND SUMMARY

A thorough review of ongoing data acquisition and instrument performance criteria was made to assess overall GC/MS instrument performance. No changes in instrument performance were noted that would result in the degradation of data quality. No indications of unacceptable instrument performance (i.e., shifts in baseline stability, retention time shifts, extraneous peaks, sensitivity) were found during the quality assurance review.

In general, the semi-volatile data presented in this report met the protocol-specified QA/QC requirements. Minor blank contamination was detected in the samples. Several compounds did not meet the QC limits for the continuing calibrations; all associated results were qualified as estimates. The sampling to extraction holding time was exceeded, though not grossly exceeded, for samples associated with SDG Nos. B05WN8, and B05WP5 and several samples in SDG No. B05WV6. As required by Westinghouse Hanford protocols, all results for these samples were flagged "J" and are considered estimates only. Sample number B05WV7 in SDG No. B05WV7 exhibited matrix spike/matrix spike duplicate recoveries and RPDs outside of QC limits. All associated results are flagged as estimates ("J"). All other results are considered to be acceptable and usable for all purposes.

SEMIVOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case:	SDG: B05WN8																		
Sample Number		B05WN8		B05WN9		B05WP0		B05WP1		B05WT8		B05WT9		B05WV2		B05WV3		B05WV4	
Location		116-H-9		116-H-9		116-H-9		116-H-3		116-H-7		116-H-7		116-H-7		116-H-7		116-H-7	
Remarks																			
Sample Date		02/26/92		02/27/92		02/27/92		03/04/92		02/27/92		02/28/92		03/02/92		03/02/92		03/02/92	
Extraction Date		03/11/92		03/11/92		03/11/92		03/11/92		03/13/92		03/11/92		03/11/92		03/11/92		03/11/92	
Analysis Date		04/09/92		04/09/92		04/09/92		04/09/92		04/09/92		04/07/92		04/09/92		04/14/92		04/09/92	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
bis(2-Chloroethyl)ether	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
2-Chlorophenol	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
1,3-Dichlorobenzene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
Benzyl Alcohol	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
1,2-Dichlorobenzene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
2-Methylphenol	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
bis(2-Chloroisopropyl)Ether	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
4-Methylphenol	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
N-Nitroso-di-n-propylamine	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
Hexachloroethane	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
Nitrobenzene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
Isophorone	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
2-Nitrophenol	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
2,4-Dimethylphenol	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
Benzoic acid	1700	1700	UJ	1600	UJ	1600	UJ	1600	UJ	1700	UJ	1700	UJ	1700	UJ	1700	UJ	1600	UJ
bis(2-Chloroethoxy)methane	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
2,4-Dichlorophenol	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
1,2,4-Trichlorobenzene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
Naphthalene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
4-Chloroaniline	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
Hexachlorobutadiene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
4-Chloro-3-methylphenol	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
2-Methylnaphthalene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
Hexachlorocyclopentadiene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
2,4,6-Trichlorophenol	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
2,4,5-Trichlorophenol	1700	1700	UJ	1600	UJ	1600	UJ	1600	UJ	1700	UJ	1700	UJ	1700	UJ	1700	UJ	1600	UJ
2-Chloronaphthalene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
2-Nitroaniline	1700	1700	UJ	1600	UJ	1600	UJ	1600	UJ	1700	UJ	1700	UJ	1700	UJ	1700	UJ	1600	UJ
Dimethylphthalate	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ
Acenaphthylene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	340	UJ	350	UJ	330	UJ

SEMIVOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case:	SDG: B05WN8																				
Sample Number		B05WN8		B05WN9		B05WP0		B05WP1		B05WT8		B05WT9		B05WV2		B05WV3		B05WV4			
Location		116-H-9		116-H-9		116-H-9		116-H-3		116-H-7		116-H-7		116-H-7		116-H-7		116-H-7			
Remarks																					
Sample Date		02/26/92		02/27/92		02/27/92		03/04/92		02/27/92		02/28/92		03/02/92		03/02/92		03/02/92			
Extraction Date		03/11/92		03/11/92		03/11/92		03/11/92		03/13/92		03/11/92		03/11/92		03/11/92		03/11/92			
Analysis Date		04/09/92		04/09/92		04/09/92		04/09/92		04/09/92		04/07/92		04/09/92		04/14/92		04/09/92			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
3-Nitroaniline	1700	1700	UJ	1600	UJ	1600	UJ	1600	UJ	1700	UJ	1700	UJ	1700	UJ	1700	UJ	1600	UJ		
Acenaphthene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
2,4-Dinitrophenol	1700	1700	UJ	1600	UJ	1600	UJ	1600	UJ	1700	UJ	1700	UJ	1700	UJ	1700	UJ	1600	UJ		
4-Nitrophenol	1700	1700	UJ	1600	UJ	1600	UJ	1600	UJ	1700	UJ	1700	UJ	1700	UJ	1700	UJ	1600	UJ		
Dibenzofuran	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
2,4-Dinitrotoluene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
2,6-Dinitrotoluene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
Diethylphthalate	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
4-Chlorophenyl-phenyl ether	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
Fluorene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
4-Nitroaniline	1700	1700	UJ	1600	UJ	1600	UJ	1600	UJ	1700	UJ	1700	UJ	1700	UJ	1700	UJ	1600	UJ		
4,6-Dinitro-2-methylphenol	1700	1700	UJ	1600	UJ	1600	UJ	1600	UJ	1700	UJ	1700	UJ	1700	UJ	1700	UJ	1600	UJ		
N-Nitrosodiphenylamine	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
4-Bromophenyl-phenylether	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
Hexachlorobenzene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
Pentachlorophenol	1700	1700	UJ	1600	UJ	1600	UJ	1600	UJ	1700	UJ	1700	UJ	1700	UJ	1700	UJ	1600	UJ		
Phenanthrene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
Anthracene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
Di-n-butylphthalate	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
Fluoranthene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
Pyrene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
Butylbenzylphthalate	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
3,3'-Dichlorobenzidine	330	690	UJ	690	UJ	650	UJ	650	UJ	690	UJ	690	UJ	690	UJ	700	UJ	660	UJ		
Benz(a)anthracene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
bis(2-Ethylhexyl)phthalate	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
Chrysene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
Di-n-octylphthalate	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
Benzo(b)fluoranthene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
Benzo(k)fluoranthene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
Benzo(a)pyrene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
Indeno(1,2,3-cd)pyrene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
Dibenz(a,h)anthracene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		
Benzo(g,h,i)perylene	330	340	UJ	330	UJ	320	UJ	320	UJ	340	UJ	350	UJ	330	UJ	350	UJ	330	UJ		

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case:	SDG: B05WN8																		
Sample Number		B05WV1																	
Location		116-H-7																	
Remarks		EB																	
Sample Date		02/28/92																	
Extraction Date		03/06/92																	
Analysis Date		04/10/92																	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	10	U																
bis(2-Chloroethyl)ether	10	10	U																
2-Chlorophenol	10	10	U																
1,3-Dichlorobenzene	10	10	U																
1,4-Dichlorobenzene	10	10	U																
Benzyl Alcohol	10	10	U																
1,2-Dichlorobenzene	10	10	U																
2-Methylphenol	10	10	U																
bis(2-Chloroisopropyl)Ether	10	10	U																
4-Methylphenol	10	10	U																
N-Nitroso-di-n-propylamine	10	10	U																
Hexachloroethane	10	10	U																
Nitrobenzene	10	10	U																
Isophorone	10	10	U																
2-Nitrophenol	10	10	U																
2,4-Dimethylphenol	10	10	U																
Benzoic acid	50	50	U																
bis(2-Chloroethoxy)methane	10	10	U																
2,4-Dichlorophenol	10	10	U																
1,2,4-Trichlorobenzene	10	10	U																
Naphthalene	10	10	U																
4-Chloroaniline	10	10	U																
Hexachlorobutadiene	10	10	U																
4-Chloro-3-methylphenol	10	10	U																
2-Methylnaphthalene	10	10	U																
Hexachlorocyclopentadiene	10	10	U																
2,4,6-Trichlorophenol	10	10	U																
2,4,5-Trichlorophenol	50	50	U																
2-Chloronaphthalene	10	10	U																
2-Nitroaniline	50	50	U																
Dimethylphthalate	10	10	U																
Acenaphthylene	10	10	U																

EB = Equipment Blank

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case:	SDG: B05WN8																				
Sample Number		B05WV1																			
Location		116-H-7																			
Remarks		EB																			
Sample Date		02/28/92																			
Extraction Date		03/06/92																			
Analysis Date		04/10/92																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	50	50	U																		
Acenaphthene	10	10	U																		
2,4-Dinitrophenol	50	50	U																		
4-Nitrophenol	50	50	U																		
Dibenzofuran	10	10	U																		
2,4-Dinitrotoluene	10	10	U																		
2,6-Dinitrotoluene	10	10	U																		
Diethylphthalate	10	10	U																		
4-Chlorophenyl-phenyl ether	10	10	U																		
Fluorene	10	10	U																		
4-Nitroaniline	50	50	U																		
4,6-Dinitro-2-methylphenol	50	50	U																		
N-Nitrosodiphenylamine	10	10	U																		
4-Bromophenyl-phenylether	10	10	U																		
Hexachlorobenzene	10	10	U																		
Pentachlorophenol	50	50	U																		
Phenanthrene	10	10	U																		
Anthracene	10	10	U																		
Di-n-butylphthalate	10	10	U																		
Fluoranthene	10	10	U																		
Pyrene	10	10	U																		
Butylbenzylphthalate	10	10	U																		
3,3'-Dichlorobenzidine	10	20	U																		
Benz(a)anthracene	10	10	U																		
bis(2-Ethylhexyl)Phthalate	10	10	U																		
Chrysene	10	10	U																		
Di-n-octylphthalate	10	10	U																		
Benzo(b)fluoranthene	10	10	U																		
Benzo(k)fluoranthene	10	10	U																		
Benzo(a)pyrene	10	10	U																		
Indeno(1,2,3-cd)pyrene	10	10	U																		
Dibenz(a,h)anthracene	10	10	U																		
Benzo(g,h,I)perylene	10	10	U																		

EB = Equipment Blank

HOLDING TIME SUMMARY

SDG: B05WN8	REVIEWER: RB			DATE: 10/26/92		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B05WN8	BNA	2/26/92	3/11/92	4/09/92	7	40	J
B05WN9	BNA	2/27/92	3/11/92	4/09/92	7	40	J
B05WP0	BNA	2/27/92	3/11/92	4/09/92	7	40	J
B05WT8	BNA	2/27/92	3/13/92	4/09/92	7	40	J
B05WT9	BNA	2/28/92	3/11/92	4/07/92	7	40	J
B05WV2	BNA	3/02/92	3/11/92	4/09/92	7	40	J
B05WV3	BNA	3/02/92	3/11/92	4/14/92	7	40	J
B05WV4	BNA	3/02/92	3/11/92	4/09/92	7	40	J

BLANK AND SAMPLE DATA SUMMARY

SDG: B05WN8	REVIEWER: RB			DATE: 10/26/92				PAGE_1_OF_1_	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
SBLK0313S	Di-n-butylphthalate	77	J		ug/kg	385	770	B05WP1, B05WT8, B05WT9, B05WV4	U

DATA QUALIFICATION SUMMARY

SDG: B05WN8	REVIEWER: RB	DATE: 10/26/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All BNA compounds	J	B05WV2, B05NT9, B05WN9, B05WN8, B05WP0, B05WV3, B05WV4, B05WT8	Holding time
Di-n-butylphthalate	U	B05WP1, B05WT8, B05WT9, B05WV4	Lab blank contamination

SEMIVOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project:WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case:	SDG: B05WP5																				
Sample Number		B05WP5																			
Location		116-H-3																			
Remarks																					
Sample Date		3/05/92																			
Extraction Date		3/18/92																			
Analysis Date		4/10/92																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	330	340	UJ																		
bis(2-Chloroethyl)ether	330	340	UJ																		
2-Chlorophenol	330	340	UJ																		
1,3-Dichlorobenzene	330	340	UJ																		
1,4-Dichlorobenzene	330	340	UJ																		
Benzyl Alcohol	330	340	UJ																		
1,2-Dichlorobenzene	330	340	UJ																		
2-Methylphenol	330	340	UJ																		
bis(2-Chloroisopropyl)Ether	330	340	UJ																		
4-Methylphenol	330	340	UJ																		
N-Nitroso-di-n-propylamine	330	340	UJ																		
Hexachloroethane	330	340	UJ																		
Nitrobenzene	330	340	UJ																		
Isophorone	330	340	UJ																		
2-Nitrophenol	330	340	UJ																		
2,4-Dimethylphenol	330	340	UJ																		
Benzoic acid	1700	1600	UJ																		
bis(2-Chloroethoxy)methane	330	340	UJ																		
2,4-Dichlorophenol	330	340	UJ																		
1,2,4-Trichlorobenzene	330	340	UJ																		
Naphthalene	330	340	UJ																		
4-Chloroaniline	330	340	UJ																		
Hexachlorobutadiene	330	340	UJ																		
4-Chloro-3-methylphenol	330	340	UJ																		
2-Methylnaphthalene	330	340	UJ																		
Hexachlorocyclopentadiene	330	340	UJ																		
2,4,6-Trichlorophenol	330	340	UJ																		
2,4,5-Trichlorophenol	1700	1600	UJ																		
2-Chloronaphthalene	330	340	UJ																		
2-Nitroaniline	1700	1600	UJ																		
Dimethylphthalate	330	340	UJ																		
Acenaphthylene	330	340	UJ																		
2,6-Dinitrotoluene	330	340	UJ																		

SEMIVOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case:	SDG: B05WP5																				
Sample Number		B05WP5																			
Location		116-H-3																			
Remarks																					
Sample Date		3/05/92																			
Extraction Date		3/18/92																			
Analysis Date		4/10/92																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	1700	1600	UJ																		
Acenaphthene	330	340	UJ																		
2,4-Dinitrophenol	1700	1600	UJ																		
4-Nitrophenol	1700	1600	UJ																		
Dibenzofuran	330	340	UJ																		
2,4-Dinitrotoluene	330	340	UJ																		
Diethylphthalate	330	230	J																		
4-Chlorophenyl-phenyl ether	330	340	UJ																		
Fluorene	330	340	UJ																		
4-Nitroaniline	1700	1600	UJ																		
4,6-Dinitro-2-methylphenol	1700	1600	UJ																		
N-Nitrosodiphenylamine	330	340	UJ																		
4-Bromophenyl-phenylether	330	340	UJ																		
Hexachlorobenzene	330	340	UJ																		
Pentachlorophenol	1700	1600	UJ																		
Phenanthrene	330	340	UJ																		
Anthracene	330	340	UJ																		
Di-n-butylphthalate	330	340	UJ																		
Fluoranthene	330	340	UJ																		
Pyrene	330	340	UJ																		
Butylbenzylphthalate	330	340	UJ																		
3,3'-Dichlorobenzidine	330	680	UJ																		
Benz(a)anthracene	330	340	UJ																		
Chrysene	330	340	UJ																		
bis(2-Ethylhexyl)phthalate	330	340	UJ																		
Di-n-octylphthalate	330	340	UJ																		
Benzo(b)fluoranthene	330	340	UJ																		
Benzo(k)fluoranthene	330	340	UJ																		
Benzo(a)pyrene	330	340	UJ																		
Indeno(1,2,3-cd)pyrene	330	340	UJ																		
Dibenz(a,h)anthracene	330	340	UJ																		
Benzo(g,h,i)perylene	330	340	UJ																		

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case:	SDG: B05WP5																				
Sample Number		B05WP7																			
Location		116-H-3																			
Remarks		EB																			
Sample Date		3/05/92																			
Extraction Date		3/12/92																			
Analysis Date		4/10/92																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	10	U																		
bis(2-Chloroethyl)ether	10	10	U																		
2-Chlorophenol	10	10	U																		
1,3-Dichlorobenzene	10	10	U																		
1,4-Dichlorobenzene	10	10	U																		
Benzyl Alcohol	10	10	U																		
1,2-Dichlorobenzene	10	10	U																		
2-Methylphenol	10	10	U																		
bis(2-Chloroisopropyl)Ether	10	10	U																		
4-Methylphenol	10	10	U																		
N-Nitroso-di-n-propylamine	10	10	U																		
Hexachloroethane	10	10	U																		
Nitrobenzene	10	10	U																		
Isophorone	10	10	U																		
2-Nitrophenol	10	10	U																		
2,4-Dimethylphenol	10	10	U																		
Benzoic acid	50	50	U																		
bis(2-Chloroethoxy)methane	10	10	U																		
2,4-Dichlorophenol	10	10	U																		
1,2,4-Trichlorobenzene	10	10	U																		
Naphthalene	10	10	U																		
4-Chloroaniline	10	10	U																		
Hexachlorobutadiene	10	10	U																		
4-Chloro-3-methylphenol	10	10	U																		
2-Methylnaphthalene	10	10	U																		
Hexachlorocyclopentadiene	10	10	U																		
2,4,6-Trichlorophenol	10	10	U																		
2,4,5-Trichlorophenol	50	50	U																		
2-Chloronaphthalene	10	10	U																		
2-Nitroaniline	50	50	U																		
Dimethylphthalate	10	10	U																		
Acenaphthylene	10	10	U																		

EB = Equipment Blank

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case:	SDG: B05WP5																				
Sample Number		B05WP7																			
Location		116-H-3																			
Remarks		EB																			
Sample Date		3/05/92																			
Extraction Date		3/12/92																			
Analysis Date		4/10/92																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	50	50	U																		
Acenaphthene	10	10	U																		
2,4-Dinitrophenol	50	50	U																		
4-Nitrophenol	50	50	U																		
Dibenzofuran	10	10	U																		
2,4-Dinitrotoluene	10	10	U																		
2,6-Dinitrotoluene	10	10	U																		
Diethylphthalate	10	10	U																		
4-Chlorophenyl-phenyl ether	10	10	U																		
Fluorene	10	10	U																		
4-Nitroaniline	50	50	U																		
4,6-Dinitro-2-methylphenol	50	50	U																		
N-Nitrosodiphenylamine	10	10	U																		
4-Bromophenyl-phenylether	10	10	U																		
Hexachlorobenzene	10	10	U																		
Pentachlorophenol	50	50	U																		
Phenanthrene	10	10	U																		
Anthracene	10	10	U																		
Di-n-butylphthalate	10	6	J																		
Fluoranthene	10	10	U																		
Pyrene	10	10	U																		
Butylbenzylphthalate	10	10	U																		
3,3'-Dichlorobenzidine	10	20	U																		
Benz(a)anthracene	10	10	U																		
bis(2-Ethylhexyl)Phthalate	10	10	U																		
Chrysene	10	10	U																		
Di-n-octylphthalate	10	10	U																		
Benzo(b)fluoranthene	10	10	U																		
Benzo(k)fluoranthene	10	10	U																		
Benzo(a)pyrene	10	10	U																		
Indeno(1,2,3-cd)pyrene	10	10	U																		
Dibenz(a,h)anthracene	10	10	U																		
Benzo(g,h,i)perylene	10	10	U																		

EB = Equipment Blank

HOLDING TIME SUMMARY

SDG: B05WP5	REVIEWER: MY			DATE: 2/03/93		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B05WP5	BNA	3/05/92	3/18/92	4/10/92	7	40	J

DATA QUALIFICATION SUMMARY

SDG: B05WP5	REVIEWER: MY	DATE: 2/03/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
ALL BNA ANALYTES	J	B05WP5	Exceeded holding time

SEMIVOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case:	SDG: B05WV6																				
Sample Number		B05WV6		B05WV8		B05WV9		B05WW0		B05WW4		B05WW5									
Location		116-H-1		116-H-1		116-H-1		116-H-1		116-H-1		116-H-2									
Remarks		Split																			
Sample Date		03/09/92		03/09/92		03/10/92		03/10/92		03/11/92		03/13/92									
Extraction Date		03/21/92		03/21/92		03/21/92		03/21/92		03/21/92		03/21/92									
Analysis Date		04/14/92		04/14/92		04/14/92		04/14/92		04/14/92		04/14/92									
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
bis(2-Chloroethyl)ether	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
2-Chlorophenol	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
1,3-Dichlorobenzene	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
1,4-Dichlorobenzene	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Benzyl Alcohol	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
1,2-Dichlorobenzene	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
2-Methylphenol	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
bis(2-Chloroisopropyl)Ether	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
4-Methylphenol	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
N-Nitroso-di-n-propylamine	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Hexachloroethane	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Nitrobenzene	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Isophorone	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
2-Nitrophenol	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
2,4-Dimethylphenol	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Benzoic acid	1700	1700	UJ	1700	UJ	1600	UJ	1700	UJ	1600	UJ	1600	U								
bis(2-Chloroethoxy)methane	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
2,4-Dichlorophenol	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
1,2,4-Trichlorobenzene	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Naphthalene	330	180	UJ	180	UJ	340	UJ	350	UJ	330	UJ	340	U								
4-Chloroaniline	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Hexachlorobutadiene	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
4-Chloro-3-methylphenol	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
2-Methylnaphthalene	330	42	J	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Hexachlorocyclopentadiene	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
2,4,6-Trichlorophenol	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
2,4,5-Trichlorophenol	1700	1700	UJ	1700	UJ	1600	UJ	1700	UJ	1600	UJ	1600	U								
2-Chloronaphthalene	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
2-Nitroaniline	1700	1700	UJ	1700	UJ	1600	UJ	1700	UJ	1600	UJ	1600	U								
Dimethylphthalate	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Acenaphthylene	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								

SEMIVOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case:	SDG: B05WV6																				
Sample Number		B05WV6		B05WV8		B05WV9		B05WW0		B05WW4		B05WW5									
Location		116-H-1		116-H-1		116-H-1		116-H-1		116-H-1		116-H-2									
Remarks		Split																			
Sample Date		03/09/92		03/09/92		03/10/92		03/10/92		03/11/92		03/13/92									
Extraction Date		03/21/92		03/21/92		03/21/92		03/21/92		03/21/92		03/21/92									
Analysis Date		04/14/92		04/14/92		04/14/92		04/14/92		04/14/92		04/14/92									
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	1700	1700	UJ	1700	UJ	1600	UJ	1700	UJ	1600	UJ	1600	U								
Acenaphthene	330	210	J	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
2,4-Dinitrophenol	1700	1700	UJ	1700	UJ	1600	UJ	1700	UJ	1600	UJ	1600	U								
4-Nitrophenol	1700	1700	UJ	1700	UJ	1600	UJ	1700	UJ	1600	UJ	1600	U								
Dibenzofuran	330	130	J	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
2,4-Dinitrotoluene	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
2,6-Dinitrotoluene	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Diethylphthalate	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
4-Chlorophenyl-phenyl ether	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Fluorene	330	190	J	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
4-Nitroaniline	1700	1700	UJ	1700	UJ	1600	UJ	1700	UJ	1600	UJ	1600	U								
4,6-Dinitro-2-methylphenol	1700	1700	UJ	1700	UJ	1600	UJ	1700	UJ	1600	UJ	1600	U								
N-Nitrosodiphenylamine	330	340	UJ	59	J	340	UJ	350	UJ	330	UJ	340	U								
4-Bromophenyl-phenylether	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Hexachlorobenzene	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Pentachlorophenol	1700	1700	UJ	1700	UJ	1600	UJ	1700	UJ	1600	UJ	1600	U								
Phenanthrene	330	1500	J	41	J	35	J	350	UJ	330	UJ	340	U								
Anthracene	330	430	J	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Di-n-butylphthalate	330	59	J	68	J	50	J	350	UJ	46	J	48	J								
Fluoranthene	330	1800	J	63	J	110	J	350	UJ	330	UJ	340	U								
Pyrene	330	1200	J	48	J	85	J	350	UJ	330	UJ	340	U								
Butylbenzylphthalate	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
3,3'-Dichlorobenzidine	330	690	UJ	690	UJ	670	UJ	690	UJ	660	UJ	680	U								
Benz(a)anthracene	330	940	J	39	J	78	J	350	UJ	330	UJ	340	U								
bis(2-Ethylhexyl)Phthalate	330	340	UJ	68	J	340	UJ	350	UJ	330	UJ	340	U								
Chrysene	330	920	J	340	UJ	77	J	350	UJ	330	UJ	340	U								
Di-n-octylphthalate	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Benzo(b)fluoranthene	330	890	J	340	UJ	130	J	350	UJ	330	UJ	340	U								
Benzo(k)fluoranthene	330	760	J	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Benzo(a)pyrene	330	810	J	340	UJ	61	J	350	UJ	330	UJ	340	U								
Indeno(1,2,3-cd)pyrene	330	520	J	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Dibenz(a,h)anthracene	330	340	UJ	340	UJ	340	UJ	350	UJ	330	UJ	340	U								
Benzo(g,h,i)perylene	330	410	J	340	UJ	340	UJ	350	UJ	330	UJ	340	U								

HOLDING TIME SUMMARY

SDG: B05WV6	REVIEWER: SC			DATE: 10/26/92			PAGE 1 OF 1
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B05WV6	BNA	3/9/92	3/21/92	4/14/92	7	40	J
B05WV8	BNA	3/9/92	3/21/92	4/14/92	7	40	J
B05WV9	BNA	3/10/92	3/21/92	4/14/92	7	40	J
B05WW0	BNA	3/11/92	3/21/92	4/14/92	7	40	J
B05WW4	BNA	3/11/92	3/21/92	4/14/92	7	40	J

DATA QUALIFICATION SUMMARY

SDG: B05WV6	REVIEWER: SC	DATE: 10/26/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All BNA compounds	J	All except B05WW5	Extraction holding time

SEMIVOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B05WV7																				
Sample Number		B05WV7																			
Location		116-H-1																			
Remarks		Split																			
Sample Date		03/09/92																			
Extraction Date		03/16/92																			
Analysis Date		03/31/92																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	330	1800	UJ																		
bis(2-Chloroethyl)ether	330	1800	UJ																		
2-Chlorophenol	330	1800	UJ																		
1,3-Dichlorobenzene	330	1800	UJ																		
1,4-Dichlorobenzene	330	1800	UJ																		
Benzyl Alcohol	330	1800	UJ																		
1,2-Dichlorobenzene	330	1800	UJ																		
2-Methylphenol	330	1800	UJ																		
bis(2-Chloroisopropyl)Ether	330	1800	UJ																		
4-Methylphenol	330	1800	UJ																		
N-Nitroso-di-n-propylamine	330	1800	UJ																		
Hexachloroethane	330	1800	UJ																		
Nitrobenzene	330	1800	UJ																		
Isophorone	330	1800	UJ																		
2-Nitrophenol	330	1800	UJ																		
2,4-Dimethylphenol	330	1800	UJ																		
Benzoic acid	1700	8800	UJ																		
bis(2-Chloroethoxy)methane	330	1800	UJ																		
2,4-Dichlorophenol	330	1800	UJ																		
1,2,4-Trichlorobenzene	330	1800	UJ																		
Naphthalene	330	1800	UJ																		
4-Chloroaniline	330	1800	UJ																		
Hexachlorobutadiene	330	1800	UJ																		
4-Chloro-3-methylphenol	330	1800	UJ																		
2-Methylnaphthalene	330	350	J																		
Hexachlorocyclopentadiene	330	1800	UJ																		
2,4,6-Trichlorophenol	330	1800	UJ																		
2,4,5-Trichlorophenol	1700	8800	UJ																		
2-Chloronaphthalene	330	1800	UJ																		
2-Nitroaniline	1700	8800	UJ																		
Dimethylphthalate	330	1800	UJ																		
Acenaphthylene	330	1800	UJ																		
2,6-Dinitrotoluene	330	1800	UJ																		

SEMIVOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B05WV7																				
Sample Number		B05WV7																			
Location		116-H-1																			
Remarks		Split																			
Sample Date		03/09/92																			
Extraction Date		03/16/92																			
Analysis Date		03/31/92																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	1700	8800	UJ																		
Acenaphthene	330	2100	J																		
2,4-Dinitrophenol	1700	8800	UJ																		
4-Nitrophenol	1700	8800	UJ																		
Dibenzofuran	330	1200	J																		
2,4-Dinitrotoluene	330	1800	UJ																		
Diethylphthalate	330	1800	UJ																		
4-Chlorophenyl-phenyl ether	330	1800	UJ																		
Fluorene	330	1900	J																		
4-Nitroaniline	1700	8800	UJ																		
4,6-Dinitro-2-methylphenol	1700	8800	UJ																		
N-Nitrosodiphenylamine	330	1800	UJ																		
4-Bromophenyl-phenylether	330	1800	UJ																		
Hexachlorobenzene	330	1800	UJ																		
Pentachlorophenol	1700	8800	UJ																		
Phenanthrene	330	16000	J																		
Anthracene	330	4100	J																		
Di-n-butylphthalate	330	1800	UJ																		
Fluoranthene	330	18000	J																		
Pyrene	330	17000	J																		
Butylbenzylphthalate	330	1800	UJ																		
3,3'-Dichlorobenzidine	330	3500	UJ																		
Benz(a)anthracene	330	8600	J																		
Chrysene	330	7800	J																		
bis(2-Ethylhexyl)phthalate	330	1800	UJ																		
Di-n-octylphthalate	330	1800	UJ																		
Benzo(b)fluoranthene	330	6500	J																		
Benzo(k)fluoranthene	330	7200	J																		
Benzo(a)pyrene	330	8700	J																		
Indeno(1,2,3-cd)pyrene	330	4700	J																		
Dibenz(a,h)anthracene	330	2000	J																		
Benzo(g,h,i)perylene	330	4900	J																		

CALIBRATION DATA SUMMARY

SDG: B05WV7	REVIEWER: SC	DATE: 10/26/92		PAGE 1 OF 1	
COMMENTS:					
CALIB. TYPE:	INITIAL CONTINUING	INSTRUMENT:			
CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
3/31/92	3-Nitroaniline	0.344	-63.0	B05WV7	J
3/31/92	4-Nitroaniline	0.237	-39.4	B05WV7	J
3/31/92	3,3'-Dichlorobenzidine	0.331	-67.2	B05WV7	J
3/31/92	Indeno(1,2,3-cd)pyrene	1.285	-30.9	B05WV7	J
3/31/92	Dibenzo(a,h)anthracene	1.001	-32.6	B05WV7	J

ACCURACY DATA SUMMARY

SDG: B05WV7	REVIEWER: SC	DATE: 10/26/92	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	MS/MSD % RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B05WV7	Phenol	12	B05WV7	J
B05WV7	Acenaphthene	0	B05WV7	J
B05WV7	Pyrene	0	B05WV7	J

PRECISION DATA SUMMARY

SDG: B05WV7	REVIEWER: SC	DATE: 10/26/92		PAGE 1 OF 1	
COMMENTS:					
COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Phenol	B05WV7	B05WV7D	135	B05WV7	J

DATA QUALIFICATION SUMMARY

SDG: B05WV7	REVIEWER: SC	DATE: 10/26/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
3-Nitroaniline	J	B05WV7	Continuing calibration
4-Nitroaniline	J	B05WV7	Continuing calibration
3,3'-Dichlorobenzidine	J	B05WV7	Continuing calibration
Indeno(1,2,3-cd)pyrene	J	B05WV7	Continuing calibration
Dibenzo(a,h)anthracene	J	B05WV7	Continuing calibration
All analytes	J	B05WV7	Matrix spike recovery
Phenol	J	B05WV7	MS/MSD RPD out of specification

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case:	SDG: B05WW6																				
Sample Number		B05WW6		B05WW7																	
Location		116-H-2		116-H-2																	
Remarks		DUP		DUP																	
Sample Date		03/16/92		03/16/92																	
Extraction Date		03/26/92		03/26/92																	
Analysis Date		04/15/92		04/15/92																	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	330	340	U	340	U																
bis(2-Chloroethyl)ether	330	340	U	340	U																
2-Chlorophenol	330	340	U	340	U																
1,3-Dichlorobenzene	330	340	U	340	U																
1,4-Dichlorobenzene	330	340	U	340	U																
Benzyl Alcohol	330	340	U	340	U																
1,2-Dichlorobenzene	330	340	U	340	U																
2-Methylphenol	330	340	U	340	U																
bis(2-Chloroisopropyl)Ether	330	340	U	340	U																
4-Methylphenol	330	340	U	340	U																
N-Nitroso-di-n-propylamine	330	340	U	340	U																
Hexachloroethane	330	340	U	340	U																
Nitrobenzene	330	340	U	340	U																
Isophorone	330	340	U	340	U																
2-Nitrophenol	330	340	U	340	U																
2,4-Dimethylphenol	330	340	U	340	U																
Benzoic acid	1700	1700	U	1700	U																
bis(2-Chloroethoxy)methane	330	340	U	340	U																
2,4-Dichlorophenol	330	340	U	340	U																
1,2,4-Trichlorobenzene	330	340	U	340	U																
Naphthalene	330	340	U	340	U																
4-Chloroaniline	330	340	U	340	U																
Hexachlorobutadiene	330	340	U	340	U																
4-Chloro-3-methylphenol	330	340	U	340	U																
2-Methylnaphthalene	330	340	U	340	U																
Hexachlorocyclopentadiene	330	340	U	340	U																
2,4,6-Trichlorophenol	330	340	U	340	U																
2,4,5-Trichlorophenol	1700	1700	U	1700	U																
2-Chloronaphthalene	330	340	U	340	U																
2-Nitroaniline	1700	1700	U	1700	U																
Dimethylphthalate	330	340	U	340	U																
Acenaphthylene	330	340	U	340	U																

DUP = Duplicate

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case:	SDG: B05WW6																				
Sample Number		B05WW6		B05WW7																	
Location		116-H-2		116-H-2																	
Remarks		DUP		DUP																	
Sample Date		03/16/92		03/16/92																	
Extraction Date		03/26/92		03/26/92																	
Analysis Date		04/15/92		04/15/92																	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	1700	1700	U	1700	U																
Acenaphthene	330	340	U	340	U																
2,4-Dinitrophenol	1700	1700	U	1700	U																
4-Nitrophenol	1700	1700	U	1700	U																
Dibenzofuran	330	340	U	340	U																
2,4-Dinitrotoluene	330	340	U	340	U																
2,6-Dinitrotoluene	330	340	U	340	U																
Diethylphthalate	330	340	U	340	U																
4-Chlorophenyl-phenyl ether	330	340	U	340	U																
Fluorene	330	340	U	340	U																
4-Nitroaniline	1700	1700	U	1700	U																
4,6-Dinitro-2-methylphenol	1700	1700	U	1700	U																
N-Nitrosodiphenylamine	330	340	U	340	U																
4-Bromophenyl-phenylether	330	340	U	340	U																
Hexachlorobenzene	330	340	U	340	U																
Pentachlorophenol	1700	1700	U	1700	U																
Phenanthrene	330	340	U	340	U																
Anthracene	330	340	U	340	U																
Di-n-butylphthalate	330	340	U	340	U																
Fluoranthene	330	340	U	340	U																
Pyrene	330	340	U	340	U																
Butylbenzylphthalate	330	340	U	340	U																
3,3'-Dichlorobenzidine	330	690	U	690	U																
Benz(a)anthracene	330	340	U	340	U																
bis(2-Ethylhexyl)Phthalate	330	340	U	340	U																
Chrysene	330	340	U	340	U																
Di-n-octylphthalate	330	340	U	340	U																
Benzo(b)fluoranthene	330	340	U	340	U																
Benzo(k)fluoranthene	330	340	U	340	U																
Benzo(a)pyrene	330	340	U	340	U																
Indeno(1,2,3-cd)pyrene	330	340	U	340	U																
Dibenz(a,h)anthracene	330	340	U	340	U																
Benzo(g,h,i)perylene	330	340	U	340	U																

DUP = Duplicate

BLANK AND SAMPLE DATA SUMMARY

SDG: B05WW6	REVIEWER: SC			DATE: 10/26/92				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
SBLK0326S	Di-n-butylphthalate	100	J		ug/kg	500	1000	All	U

DATA QUALIFICATION SUMMARY

SDG: B05WW6	REVIEWER: SC	DATE: 10/26/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Di-n-Butylphthalate	U	All	Lab blank contamination

WELL AND SAMPLE INFORMATION				SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	PESTICIDES/PCBS
116-H-9	B05WN8	S	2/26/92	4-5
	B05WN9	S	2/27/92	4-5
	B05WP0	S	2/27/92	4-5
116-H-3	B05WP1	S	3/04/92	4-5
	B05WP5	S	3/05/92	4-9
	B05WP7	W	3/05/92	4-9
116-H-7	B05WT8	S	2/27/92	4-5
	B05WT9	S	2/28/92	4-5
	B05WV1	W	2/28/92	4-5
	B05WV2	S	3/02/92	4-5
	B05WV3	S	3/02/92	4-5
	B05WV4	S	3/02/92	4-5
116-H-1	B05WV6	S	3/09/92	4-13
	B05WV7	S	3/09/92	4-16
	B05WV8	S	3/09/92	4-13
	B05WV9	S	3/10/92	4-13
	B05WW0	S	3/10/92	4-13
	B05WW4	S	3/11/92	4-13
116-H-2	B05WW5	S	3/13/92	4-13
	B05WW6	S	3/16/92	4-17
	B05WW7	S	3/16/92	4-17

4.0 PESTICIDE AND PCB DATA VALIDATION

4.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted and found to be complete:

B05WN8 B05WP5 B05WV6 B05WV7 B05WW6

4.2 HOLDING TIMES

Analytical holding times were assessed to ascertain whether the holding time requirements for pesticide/PCB analyses were met by the laboratory. Westinghouse Hanford procedures require that samples be extracted within seven days of collection and analyzed within 40 days of extraction (WHC 1991a).

Based upon Westinghouse Hanford data validation procedures, the seven day extraction holding times were exceeded for the following samples:

- Sample numbers B05WN8, B05WN9, B05WP0, B05WT8, B05WT9, B05WV2, B05WV3 and B05WV4 in SDG No. B05WN8.
- Sample number B05WP5 in SDG No. B05WP5.
- Sample numbers B05WV6, B05WV8, B05WV9, B05WW0 and B05WW4 in SDG No. B05WV6.

These samples were flagged "J" and are considered to be estimated. However, these samples meet the requirements of EPA Data Validation Guidelines, which requires a fourteen day extraction holding time.

The holding time requirements for all of the other data packages were met.

4.2.1 Instrument Performance and Calibrations

Instrument performance was assessed to ensure that adequate chromatographic resolution and instrument sensitivity were achieved by the gas chromatographic system.

The specific criteria for acceptable instrument performance are outlined in EPA guidelines (EPA 1988a and 1988b), including

the evaluation and qualification procedures that may be performed on the analytical results.

During the quality assurance review, all indicators for acceptable instrument performance were verified. The criteria established by CLP protocols were met and the results are acceptable, except as noted.

Instrument calibration is performed to ensure that the chromatographic system is capable of producing acceptable and reliable analytical data. The initial and continuing calibrations are to be performed according to procedures established by CLP protocols. An initial calibration is performed prior to sample analysis to establish the linear range of the system, including a demonstration that all target compounds can be detected. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

4.2.2 Initial Calibrations

The laboratory performed an initial multipoint calibration for the four compounds specified at the concentrations required by CLP protocols. The linearity of the initial calibration is established when the percent RSD or the calibration factors is less than or equal to 10 percent.

All initial calibration results were acceptable.

4.2.3 Calibration Verification

The criteria for acceptable continuing calibrations requires that the calibration factors for all target compounds have a percent difference of less than or equal to 15 percent of the average calibration factor calculated for the associated initial calibration standard. The 15 percent difference value is required for results calculated using the chromatographic column which is used for quantitative purposes. In addition, the percent difference of the calibration factors calculated for the chromatographic column that is used for confirmation must be less than or equal to 20 percent.

The calibration verification results did not meet the QC results for the compounds listed below. All associated samples were qualified as estimates (J).

All calibration verification results were acceptable.

4.3 BLANKS

Method blank and field blank analyses are performed to determine the extent of laboratory or field contamination of samples. No contaminants should be present in the blanks. Analytical results for analytes present in any sample at less than 5 times the concentration of that analyte found in associated blanks should be qualified as non-detects.

There were no compounds of concern detected in the method or field blanks.

4.4 ACCURACY

Accuracy was assessed by evaluating the recoveries of the surrogate compounds and the matrix spike recoveries calculated for the sample analyses.

4.4.1 Matrix Spike Recovery

Matrix spike analyses are performed in duplicate using six compounds specified by CLP protocols. The recoveries for the six compounds must be within the acceptable quality control limits established by CLP protocols.

All matrix spike/matrix spike duplicate recoveries results were acceptable.

4.4.2 Surrogate Recovery

All surrogate recovery results were acceptable.

4.5 PRECISION

Precision is expressed by the RPD between the recoveries of the matrix spike and the matrix spike duplicate analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed by using unspiked duplicate analyses.

The matrix spike/matrix spike duplicate RPDs were acceptable.

4.6 COMPOUND IDENTIFICATION AND QUANTITATION

The data were evaluated to confirm the positive concentrations and to investigate the possibility of false negatives in all other data. Confirmation of possible false

negatives is addressed by reviewing other factors relating to analytical sensitivity (e.g., detection limits, instrument linearity, analytical recovery). These factors were found to be in control, and the data are acceptable.

All compound identifications and quantitation results are acceptable.

4.6.1 Reported Quantitation Limits

Compound quantitations and reported detection limits were recalculated and verified for a minimum of 20 percent of the samples in each case to ensure that they were accurate and are consistent with CLP requirements (EPA 1988a). The reported detection limits must be in accordance with the CRQLs specified in the applicable CLP statement of work.

The compound quantitations and the CRQLs reported were calculated correctly and were acceptable.

4.7 OVERALL ASSESSMENT AND SUMMARY

A thorough review of ongoing data acquisition and instrument performance criteria was made to assess overall GC/MS instrument performance. No changes in instrument performance were noted that would result in the degradation of data quality. No indications of unacceptable instrument performance (i.e., shifts in baseline stability, retention time shifts, extraneous peaks, or sensitivity) were found during the quality assurance review.

In general, the pesticide/PCB data presented in this report met the protocol-specified QA/QC requirements. The sampling to extraction holding time was exceeded, though not grossly exceeded for several samples. As required by Westinghouse Hanford protocols, all results for these samples were flagged "J" and are considered estimates only. All other results are acceptable and usable for all purposes.

PESTICIDE/PCB ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case:	SDG: B05WN8																		
Sample Number		B05WN8		B05WN9		B05WP0		B05WP1		B05WT8		B05WT9		B05WV2		B05WV3		B05WV4	
Location		116-H-9		116-H-9		116-H-9		116-H-3		116-H-7		116-H-7		116-H-7		116-H-7		116-H-7	
Remarks																			
Sample Date		02/26/92		02/27/92		02/27/92		03/04/92		02/27/92		02/28/92		03/02/92		03/02/92		03/02/92	
Extraction Date		03/11/92		03/11/92		03/11/92		03/11/92		03/13/92		03/11/92		03/11/92		03/11/92		03/11/92	
Analysis Date		03/20/92		03/20/92		03/20/92		03/20/92		03/20/92		03/20/92		03/20/92		03/20/92		03/20/92	
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	1.7	8.1	UJ	8.0	UJ	7.8	UJ	7.9	U	8.4	UJ	8.3	UJ	8.4	UJ	8.6	UJ	8.0	UJ
beta-BHC	1.7	8.1	UJ	8.0	UJ	7.8	UJ	7.9	U	8.4	UJ	8.3	UJ	8.4	UJ	8.6	UJ	8.0	UJ
delta-BHC	1.7	8.1	UJ	8.0	UJ	7.8	UJ	7.9	U	8.4	UJ	8.3	UJ	8.4	UJ	8.6	UJ	8.0	UJ
gamma-BHC (Lindane)	1.7	8.1	UJ	8.0	UJ	7.8	UJ	7.9	U	8.4	UJ	8.3	UJ	8.4	UJ	8.6	UJ	8.0	UJ
Heptachlor	1.7	8.1	UJ	8.0	UJ	7.8	UJ	7.9	U	8.4	UJ	8.3	UJ	8.4	UJ	8.6	UJ	8.0	UJ
Aldrin	1.7	8.1	UJ	8.0	UJ	7.8	UJ	7.9	U	8.4	UJ	8.3	UJ	8.4	UJ	8.6	UJ	8.0	UJ
Heptachlor epoxide	1.7	8.1	UJ	8.0	UJ	7.8	UJ	7.9	U	8.4	UJ	8.3	UJ	8.4	UJ	8.6	UJ	8.0	UJ
Endosulfan I	1.7	8.1	UJ	8.0	UJ	7.8	UJ	7.9	U	8.4	UJ	8.3	UJ	8.4	UJ	8.6	UJ	8.0	UJ
Dieldrin	3.3	16	UJ	16	UJ	16	UJ	16	U	17	UJ	17	UJ	17	UJ	17	UJ	16	UJ
4,4'-DDE	3.3	16	UJ	16	UJ	16	UJ	16	U	17	UJ	17	UJ	17	UJ	17	UJ	16	UJ
Endrin	3.3	16	UJ	16	UJ	16	UJ	16	U	17	UJ	17	UJ	17	UJ	17	UJ	16	UJ
Endosulfan II	3.3	16	UJ	16	UJ	16	UJ	16	U	17	UJ	17	UJ	17	UJ	17	UJ	16	UJ
4,4'-DDD	3.3	16	UJ	16	UJ	16	UJ	16	U	17	UJ	17	UJ	17	UJ	17	UJ	16	UJ
Endosulfan sulfate	3.3	16	UJ	16	UJ	16	UJ	16	U	17	UJ	17	UJ	17	UJ	17	UJ	16	UJ
4,4'-DDT	3.3	16	UJ	16	UJ	16	UJ	16	U	17	UJ	17	UJ	17	UJ	17	UJ	16	UJ
Methoxychlor	17.0	81	UJ	80	UJ	78	UJ	79	U	84	UJ	83	UJ	84	UJ	86	UJ	80	UJ
Endrin Ketone	3.3	16	UJ	16	UJ	16	UJ	16	U	17	UJ	17	UJ	17	UJ	17	UJ	16	UJ
alpha-Chlordane	1.7	81	UJ	80	UJ	78	UJ	79	U	84	UJ	83	UJ	84	UJ	86	UJ	80	UJ
gamma-Chlordane	1.7	81	UJ	80	UJ	78	UJ	79	U	84	UJ	83	UJ	84	UJ	86	UJ	80	UJ
Toxaphene	170.0	160	UJ	160	UJ	160	UJ	160	U	170	UJ	170	UJ	170	UJ	170	UJ	160	UJ
Arochlor-1016	33.0	81	UJ	80	UJ	78	UJ	79	U	84	UJ	83	UJ	84	UJ	86	UJ	80	UJ
Arochlor-1221	33.0	81	UJ	80	UJ	78	UJ	79	U	84	UJ	83	UJ	84	UJ	86	UJ	80	UJ
Arochlor-1232	67.0	81	UJ	80	UJ	78	UJ	79	U	84	UJ	83	UJ	84	UJ	86	UJ	80	UJ
Arochlor-1242	33.0	81	UJ	80	UJ	78	UJ	79	U	84	UJ	83	UJ	84	UJ	86	UJ	80	UJ
Arochlor-1248	33.0	81	UJ	80	UJ	78	UJ	79	U	84	UJ	83	UJ	84	UJ	86	UJ	80	UJ
Arochlor-1254	33.0	160	UJ	160	UJ	160	UJ	160	U	170	UJ	170	UJ	170	UJ	170	UJ	160	UJ
Arochlor-1260	33.0	160	UJ	160	UJ	160	UJ	160	U	170	UJ	170	UJ	170	UJ	170	UJ	160	UJ

PESTICIDE/PCB ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case	SDG: B05WN8																		
Sample Number		B05WV1																	
Location		116-H-7																	
Remarks		EB																	
Sample Date		2/28/92																	
Extraction Date		3/06/92																	
Analysis Date		3/20/92																	
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.05	U																		
beta-BHC	0.05	0.05	U																		
delta-BHC	0.05	0.05	U																		
gamma-BHC (Lindane)	0.05	0.05	U																		
Heptchlor	0.05	0.05	U																		
Aldrin	0.05	0.05	U																		
Heptachlor epoxide	0.05	0.05	U																		
Endosulfan I	0.05	0.05	U																		
Dieldrin	0.10	0.10	U																		
4,4'-DDE	0.10	0.10	U																		
Endrin	0.10	0.10	U																		
Endosulfan II	0.10	0.10	U																		
4,4'-DDD	0.10	0.10	U																		
Endosulfan sulfate	0.10	0.10	U																		
4,4'-DDT	0.10	0.10	U																		
Methoxychlor	0.50	0.50	U																		
Endrin Ketone	0.10	0.10	U																		
Endrin Aldehyde	0.10	0.10	U																		
alpha-Chlordane	0.05	0.50	U																		
gamma-Chlordane	0.05	0.50	U																		
Toxaphene	5.00	1.00	U																		
Arochlor-1016	1.00	0.50	U																		
Arochlor-1221	1.00	0.50	U																		
Arochlor-1232	2.00	0.50	U																		
Arochlor-1242	1.00	0.50	U																		
Arochlor-1248	1.00	0.50	U																		
Arochlor-1254	1.00	1.00	U																		
Arochlor-1260	1.00	1.00	U																		

EB = Equipment Blank

HOLDING TIME SUMMARY

SDG: B05WN8	REVIEWER: SC			DATE: 10/26/92		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B05WN8	Pesticide/PCB	2/26/92	3/11/92	3/20/92	7	40	J
B05WN9	Pesticide/PCB	2/27/92	3/11/92	3/20/92	7	40	J
B05WP0	Pesticide/PCB	2/27/92	3/11/92	3/20/92	7	40	J
B05WT9	Pesticide/PCB	2/28/92	3/11/92	3/20/92	7	40	J
B05WV2	Pesticide/PCB	3/2/92	3/11/92	3/20/92	7	40	J
B05WV3	Pesticide/PCB	3/2/92	3/11/92	3/20/92	7	40	J
B05WV4	Pesticide/PCB	3/2/92	3/11/92	3/20/92	7	40	J
B05WT8	Pesticide/PCB	2/27/92	3/13/92	3/20/92	7	40	J

DATA QUALIFICATION SUMMARY

SDG: B05WN8	REVIEWER: SC	DATE: 10/26/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All Pesticide/PCB compounds	J	B05WN8, B05WN9, B05WP0, B05WT9, B05WV2, B05WV3, B05WV4, B05WT8	Extraction holding time

PESTICIDE/PCB ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case:	SDG: B05WP5																				
Sample Number		B05WP5																			
Location		116-H-3																			
Remarks																					
Sample Date		3/05/92																			
Extraction Date		3/18/92																			
Analysis Date		3/20/92																			
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	1.7	8.0	UJ																		
beta-BHC	1.7	8.0	UJ																		
delta-BHC	1.7	8.0	UJ																		
gamma-BHC (Lindane)	1.7	8.0	UJ																		
Heptachlor	1.7	8.0	UJ																		
Aldrin	1.7	8.0	UJ																		
Heptachlor epoxide	1.7	8.0	UJ																		
Endosulfan I	1.7	8.0	UJ																		
Dieldrin	3.3	16.0	UJ																		
4,4'-DDE	3.3	16.0	UJ																		
Endrin	3.3	16.0	UJ																		
Endosulfan II	3.3	16.0	UJ																		
4,4'-DDD	3.3	16.0	UJ																		
Endosulfan sulfate	3.3	16.0	UJ																		
4,4'-DDT	3.3	16.0	UJ																		
Methoxychlor	17.0	80.0	UJ																		
Endrin Ketone	3.3	16.0	UJ																		
alpha-Chlordane	1.7	80.0	UJ																		
gamma-Chlordane	1.7	80.0	UJ																		
Toxaphene	170.0	160.0	UJ																		
Arochlor-1016	33.0	80.0	UJ																		
Arochlor-1221	33.0	80.0	UJ																		
Arochlor-1232	67.0	80.0	UJ																		
Arochlor-1242	33.0	80.0	UJ																		
Arochlor-1248	33.0	80.0	UJ																		
Arochlor-1254	33.0	160.0	UJ																		
Arochlor-1260	33.0	160.0	UJ																		

PESTICIDE/PCB ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case:	SDG: B05WP5																				
Sample Number		B05WP7																			
Location		116-H-3																			
Remarks		EB																			
Sample Date		3/05/92																			
Extraction Date		3/12/92																			
Analysis Date		3/20/92																			
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.05	U																		
beta-BHC	0.05	0.05	U																		
delta-BHC	0.05	0.05	U																		
gamma-BHC (Lindane)	0.05	0.05	U																		
Heptchlor	0.05	0.05	U																		
Aldrin	0.05	0.05	U																		
Heptachlor epoxide	0.05	0.05	U																		
Endosulfan I	0.05	0.05	U																		
Dieldrin	0.10	0.10	U																		
4,4'-DDE	0.10	0.10	U																		
Endrin	0.10	0.10	U																		
Endosulfan II	0.10	0.10	U																		
4,4'-DDD	0.10	0.10	U																		
Endosulfan sulfate	0.10	0.10	U																		
4,4'-DDT	0.10	0.10	U																		
Methoxychlor	0.50	0.50	U																		
Endrin Ketone	0.10	0.10	U																		
alpha-Chlordane	0.05	0.50	U																		
gamma-Chlordane	0.05	0.50	U																		
Toxaphene	5.00	1.00	U																		
Arochlor-1016	1.00	0.50	U																		
Arochlor-1221	1.00	0.50	U																		
Arochlor-1232	2.00	0.50	U																		
Arochlor-1242	1.00	0.50	U																		
Arochlor-1248	1.00	0.50	U																		
Arochlor-1254	1.00	1.00	U																		
Arochlor-1260	1.00	1.00	U																		

EB = Equipment Blank

HOLDING TIME SUMMARY

SDG: B05WP5	REVIEWER: MY			DATE: 2/03/93		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B05WP5	Pest/PCB	3/05/92	3/18/92	3/20/92	7	40	J

DATA QUALIFICATION SUMMARY

SDG: B05WP5	REVIEWER: MY	DATE: 2/03/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All analytes	J	B05WP5	Exceeded holding time

PESTICIDE/PCB ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																				
Laboratory: TMA																				
Case:	SDG: B05WV6																			
Sample Number		B05WV6		B05WV8		B05WV9		B05WW0		B05WW4		B05WW5								
Location		116-H-1		116-H-1		116-H-1		116-H-1		116-H-1		116-H-2								
Remarks		SPLIT																		
Sample Date		03/09/92		03/09/92		03/10/92		03/10/92		03/11/92		03/13/92								
Extraction Date		03/21/92		03/21/92		03/21/92		03/21/92		03/21/92		03/21/92								
Analysis Date		04/01/92		04/02/92		04/02/92		04/01/92		04/02/92		04/02/92								
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	1.7	8.4	UJ	8.4	UJ	8.2	UJ	8.4	UJ	8.0	UJ	8.2	U							
beta-BHC	1.7	8.4	UJ	8.4	UJ	8.2	UJ	8.4	UJ	8.0	UJ	8.2	U							
delta-BHC	1.7	8.4	UJ	8.4	UJ	8.2	UJ	8.4	UJ	8.0	UJ	8.2	U							
gamma-BHC (Lindane)	1.7	8.4	UJ	8.4	UJ	8.2	UJ	8.4	UJ	8.0	UJ	8.2	U							
Heptachlor	1.7	8.4	UJ	8.4	UJ	8.2	UJ	8.4	UJ	8.0	UJ	8.2	U							
Aldrin	1.7	8.4	UJ	8.4	UJ	8.2	UJ	8.4	UJ	8.0	UJ	8.2	U							
Heptachlor epoxide	1.7	8.4	UJ	8.4	UJ	8.2	UJ	8.4	UJ	8.0	UJ	8.2	U							
Endosulfan I	1.7	8.4	UJ	8.4	UJ	8.2	UJ	8.4	UJ	8.0	UJ	8.2	U							
Dieldrin	3.3	17	UJ	17	UJ	16	UJ	17	UJ	16	UJ	16	U							
4,4'-DDE	3.3	17	UJ	17	UJ	16	UJ	17	UJ	16	UJ	16	U							
Endrin	3.3	17	UJ	17	UJ	16	UJ	17	UJ	16	UJ	16	U							
Endosulfan II	3.3	17	UJ	17	UJ	16	UJ	17	UJ	16	UJ	16	U							
4,4'-DDD	3.3	17	UJ	17	UJ	16	UJ	17	UJ	16	UJ	16	U							
Endosulfan sulfate	3.3	17	UJ	17	UJ	16	UJ	17	UJ	16	UJ	16	U							
4,4'-DDT	3.3	17	UJ	17	UJ	16	UJ	17	UJ	16	UJ	16	U							
Methoxychlor	17.0	84	UJ	84	UJ	82	UJ	84	UJ	80	UJ	82	U							
Endrin Ketone	3.3	17	UJ	17	UJ	16	UJ	17	UJ	16	UJ	16	U							
alpha-Chlordane	1.7	84	UJ	84	UJ	82	UJ	84	UJ	80	UJ	82	U							
gamma-Chlordane	1.7	84	UJ	84	UJ	82	UJ	84	UJ	80	UJ	82	U							
Toxaphene	170.0	170	UJ	170	UJ	160	UJ	170	UJ	160	UJ	160	U							
Arochlor-1016	33.0	84	UJ	84	UJ	82	UJ	84	UJ	80	UJ	82	U							
Arochlor-1221	33.0	84	UJ	84	UJ	82	UJ	84	UJ	80	UJ	82	U							
Arochlor-1232	67.0	84	UJ	84	UJ	82	UJ	84	UJ	80	UJ	82	U							
Arochlor-1242	33.0	84	UJ	84	UJ	82	UJ	84	UJ	80	UJ	82	U							
Arochlor-1248	33.0	84	UJ	84	UJ	82	UJ	84	UJ	80	UJ	82	U							
Arochlor-1254	33.0	170	UJ	170	UJ	160	UJ	170	UJ	160	UJ	160	U							
Arochlor-1260	33.0	170	UJ	170	UJ	160	UJ	170	UJ	160	UJ	160	U							

HOLDING TIME SUMMARY

SDG: B05WV6	REVIEWER: SC			DATE: 10/26/92		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B05WV6	Pesticide/PCB	3/9/92	3/21/92	4/1/92	7	40	J
B05WV8	Pesticide/PCB	3/9/92	3/21/92	4/2/92	7	40	J
B05WV9	Pesticide/PCB	3/10/92	3/21/92	4/2/92	7	40	J
B05WW0	Pesticide/PCB	3/11/92	3/21/92	4/2/92	7	40	J
B05WW4	Pesticide/PCB	3/11/92	3/21/92	4/2/92	7	40	J

DATA QUALIFICATION SUMMARY

SDG: B05WV6	REVIEWER: SC	DATE: 10/26/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All Pesticide/PCB compounds	J	All except B05WW5	Extraction holding time

PESTICIDE/PCB ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B05WV7																				
Sample Number		B05WV7																			
Location		116-H-1																			
Remarks		SPLIT																			
Sample Date		03/09/92																			
Extraction Date		03/16/92																			
Analysis Date		03/31/92																			
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	1.7	16	U																		
beta-BHC	1.7	16	U																		
delta-BHC	1.7	16	U																		
gamma-BHC (Lindane)	1.7	16	U																		
Heptachlor	1.7	16	U																		
Aldrin	1.7	16	U																		
Heptachlor epoxide	1.7	16	U																		
Endosulfan I	1.7	16	U																		
Dieldrin	3.3	31	U																		
4,4'-DDE	3.3	31	U																		
Endrin	3.3	31	U																		
Endosulfan II	3.3	31	U																		
4,4'-DDD	3.3	31	U																		
Endosulfan sulfate	3.3	31	U																		
4,4'-DDT	3.3	31	U																		
Methoxychlor	17.0	160	U																		
Endrin Ketone	3.3	31	U																		
alpha-Chlordane	1.7	160	U																		
gamma-Chlordane	1.7	160	U																		
Toxaphene	170.0	310	U																		
Arochlor-1016	33.0	160	U																		
Arochlor-1221	33.0	160	U																		
Arochlor-1232	67.0	160	U																		
Arochlor-1242	33.0	160	U																		
Arochlor-1248	33.0	160	U																		
Arochlor-1254	33.0	310	U																		
Arochlor-1260	33.0	310	U																		

PESTICIDE/PCB ORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case:	SDG: B05WW6																				
Sample Number		B05WW6		B05WW7																	
Location		116-H-2		116-H-2																	
Remarks		DUP		DUP																	
Sample Date		03/16/92		03/16/92																	
Extraction Date		03/26/92		03/26/92																	
Analysis Date		04/02/92		04/02/92																	
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	1.7	8.2	U	8.2	U																
beta-BHC	1.7	8.2	U	8.2	U																
delta-BHC	1.7	8.2	U	8.2	U																
gamma-BHC (Lindane)	1.7	8.2	U	8.2	U																
Heptchlor	1.7	8.2	U	8.2	U																
Aldrin	1.7	8.2	U	8.2	U																
Heptachlor epoxide	1.7	8.2	U	8.2	U																
Endosulfan I	1.7	8.2	U	8.2	U																
Dieldrin	3.3	16	U	16	U																
4,4'-DDE	3.3	16	U	16	U																
Endrin	3.3	16	U	16	U																
Endosulfan II	3.3	16	U	16	U																
4,4'-DDD	3.3	16	U	16	U																
Endosulfan sulfate	3.3	16	U	16	U																
4,4'-DDT	3.3	16	U	16	U																
Methoxychlor	17.0	82	U	82	U																
Endrin Ketone	3.3	16	U	16	U																
alpha-Chlordane	1.7	82	U	82	U																
gamma-Chlordane	1.7	82	U	82	U																
Toxaphene	170.0	160	U	160	U																
Arochlor-1016	33.0	82	U	82	U																
Arochlor-1221	33.0	82	U	82	U																
Arochlor-1232	67.0	82	U	82	U																
Arochlor-1242	33.0	82	U	82	U																
Arochlor-1248	33.0	82	U	82	U																
Arochlor-1254	33.0	160	U	160	U																
Arochlor-1260	33.0	160	U	160	U																

DUP = DUPLICATE

WELL AND SAMPLE INFORMATION				SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	INORGANICS
116-H-9	B05WN8	S	2/26/92	5-10
	B05WN9	S	2/27/92	5-10
	B05WP0	S	2/27/92	5-10
116-H-3	B05WP1	S	3/04/92	5-14
	B05WP5	S	3/05/92	5-19
	B05WP7	W	3/05/92	5-20
116-H-7	B05WT8	S	2/27/92	5-10
	B05WT9	S	2/28/92	5-14
	B05WV1	W	2/28/92	5-15
	B05WV2	S	3/02/92	5-14
	B05WV3	S	3/02/92	5-14
	B05WV4	S	3/02/92	5-14
116-H-1	B05WV5	S	3/09/92	5-19
	B05WV6	S	3/09/92	5-25
	B05WV7	S	3/09/92	5-30
	B05WV8	S	3/09/92	5-25
	B05WV9	S	3/10/92	5-25
	B05WW0	S	3/10/92	5-25
	B05WW4	S	3/11/92	5-25
116-H-2	B05WW5	S	3/13/92	5-25
	B05WW6	S	3/16/92	5-35
	B05WW7	S	3/16/92	5-35

5.0 INORGANIC DATA VALIDATION

5.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted and found to be complete:

B05WN8 B05WP5 B05WV6 B05WV7 B05WW6 B05WP1

5.2 HOLDING TIMES

Analytical holding times for ICP metals, GFAA metals, and CVAA mercury analyses were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: samples must be analyzed within twenty-eight days for mercury, 14 days for cyanide, and within six months for all other metals.

Holding time requirements for all analytes in all data packages were met for this report.

5.3 INSTRUMENT PERFORMANCE AND CALIBRATIONS

Performance of specific instrument quality assurance and quality control procedures, including deficiencies noted during the quality assurance review, are outlined below.

Three calibration standards and a blank were analyzed for arsenic, selenium, thallium, and lead by GFAA. The correlation coefficient of a least squares linear regression met the requirements for calibration in all cases.

Up to five calibration standards and a blank were analyzed for mercury by CVAA. The correlation coefficient of a least squares linear regression met the requirements for calibration.

At least one standard and a blank were analyzed by ICP for all other elements.

The above calibrations were each immediately verified with an ICV standard and a calibration blank. The ICV was prepared from a source independent of the calibration standards, at a mid-calibration range concentration. The ICV percent recovery must fall within the control limits of 90 to 110 percent for metals analyzed by ICP and GFAA, and 80 to 120 percent for

mercury. Calibration linearity near the detection limit was verified with a standard prepared at a concentration near the CRDL.

The ICVs met the recommended control limits for all samples.

The calibrations were subsequently verified at regular intervals using a CCV standard. The control windows for percent recovery of CCV standards are the same as the ICV windows described above.

The CCVs met the recommended control limits in all cases.

5.3.1 ICP Calibration

An ICS is analyzed at the beginning and end of each ICP sample run to verify the laboratory interelement and background correction factors. Results for the ICS solution must fall within the control limit of ±20 percent of the true value.

A five-fold serial dilution is required for all elements analyzed by ICP whose concentrations are greater than the linear range. The subsequent concentrations of the reanalysis are compared with the original analysis. The concentration values must agree within a percent difference (%D) of 10 percent.

The ICS has been analyzed at the proper frequency and all ICSAB solution percent recovery values fell within the control limit.

5.3.2 Atomic Absorption Calibrations

Duplicate injections are required for all GFAA analyses. The duplicate injections establish the precision of the individual analytical determinations. For sample concentrations greater than the CRDL, duplicate injections must agree within ±20 percent RSD.

All duplicate injection quality control requirements were acceptable.

5.3.3 Cyanide Analysis Calibrations

Cyanide analysis was performed by mid-distillation under Method 335.2 CLP-M (semi-automated spectrophotometric). The detection limit for the semi-automated colorimetric method is approximately 10 ug/L.

The cyanide as hydrocyanic acid (HCN) is released from cyanide complexes by means of mid-reflux-distillation operation

and absorbed in a scrubber containing sodium hydroxide solution. The cyanide ion in the absorbing solution is then determined colorimetrically.

All results fell within the acceptable limits.

5.4 BLANKS

Samples with digestate concentrations (in ug/L) of less than five times (<5x) the highest amount found in any of the associated blanks have had their associated values qualified as non-detected (U). Samples with concentrations of greater than five times (>5x) the highest amount found in any of the associated blanks do not require qualification.

Due to the presence of laboratory blank contamination the following sample was flagged "U" for aluminum:

- Sample number B05WP7 in SDG No. B05WP5.

Due to the presence of laboratory blank contamination the following samples were flagged "U" for antimony:

- Sample number B05WP7 in SDG No. B05WP5.
- All samples in SDG No. B05WV6.
- All samples in SDG No. B05WW6.

Due to the presence of laboratory blank contamination the following samples were flagged "U" for arsenic:

- Sample numbers B05WN8, B05WN9 and B05WP0 in SDG No. B05WN8.
- Sample numbers B05WV9, B05WW0, B05WW4 and B05WW5 in SDG No. B05WV6.
- All samples in SDG No. B05WW6.

Due to the presence of laboratory blank contamination the following sample was flagged "U" for barium:

- Sample number B05WP7 in SDG No. B05WP5.

Due to the presence of laboratory blank contamination the following samples were flagged "U" for beryllium:

- Sample numbers B05WP5, B05WP7 and B05WV5 in SDG No. B05WP5.
- All samples in SDG No. B05WV6.
- All samples in SDG No. B05WW6.

Due to the presence of laboratory blank contamination the following samples were flagged "U" for cadmium:

- All samples in SDG No. B05WN8.
- Sample numbers B05WP5, B05WP7 and B05WV5 in SDG No. B05WP5.
- All samples in SDG No. B05WW6.

Due to the presence of laboratory blank contamination the following samples were flagged "U" for copper:

- Sample numbers B05WP7 and B05WV5 in SDG No. B05WP5.

Due to the presence of laboratory blank contamination the following sample was flagged "U" for iron:

- Sample number B05WP7 in SDG No. B05WP5.

Due to the presence of laboratory blank contamination the following sample was flagged "U" for lead:

- Sample number B05WP7 in SDG No. B05WP5.

Due to the presence of laboratory blank contamination the following samples were flagged "U" for silver:

- All samples in SDG No. B05WV6.
- All samples in SDG No. B05WW6.

Due to the presence of laboratory blank contamination the following sample was flagged "U" for sodium:

- Sample number B05WV7 in SDG No. B05WV7.

Due to the presence of laboratory blank contamination the following sample was flagged "U" for vanadium:

- Sample number B05WP7 in SDG No. B05WP5.

All other laboratory blank results are acceptable.

5.5 ACCURACY

5.5.1 Matrix Spike Recovery

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix

spike recoveries must generally fall within the range of 75 to 125 percent.

Matrix spike recoveries fell outside the quality control requirement for antimony in SDG Nos. B05WN8, B05WV6, B05WW6, sample numbers B05WP5 and B05WV5 in SDG No. B05WP5 and all soil samples in SDG No. B05WP1. All associated samples were qualified as estimates "J".

Matrix spike recoveries fell outside the quality control requirement for arsenic in SDG No. B05WV7. All associated samples were qualified as estimates "J".

Matrix spike recoveries fell outside the quality control requirement for lead in SDG No. B05WV7 and sample numbers B05WP5 and B05WV5 in SDG No. B05WP5. All associated samples were qualified as estimates "J".

Matrix spike recoveries fell outside the quality control requirement for manganese in sample numbers B05WP5 and B05WV5 in SDG No. B05WP5. All associated samples were qualified as estimates "J".

Matrix spike recoveries fell outside the quality control requirement for selenium in SDG Nos. B05WV6, B05WV7 and all soil samples in SDG No. B05WP1. All associated samples were qualified as estimates "J".

The matrix spike recovery result for selenium in sample numbers B05WP5 and B05WV5 in SDG No. B05WP5 grossly exceeded the the QC limits. All associated results were rejected and flagged "R".

Matrix spike recoveries fell outside the quality control requirement for silver in SDG Nos. B05WN8 and B05WV7. All associated samples were qualified as estimates "J".

Matrix spike recoveries fell outside the quality control requirement for thallium in SDG No. B05WN8. All associated samples were qualified as estimates "J".

5.5.2 Laboratory Control Sample Recovery

The LCS monitors the overall performance of the analysis, including the sample preparation. An LCS should be digested or distilled and analyzed with every group of samples which have been prepared together. The performance criteria for solid LCS samples are established through interlaboratory studies coordinated by a certifying agency (e.g., EPA or an independent commercial supplier).

One solid LCS was digested and analyzed for each of the cases in this report that contained soil samples. The results were compared against the control windows established by the laboratory and were found to be acceptable.

The LCS recovery for arsenic was above QC requirements for SDG No. B05WV6. All associated arsenic results were flagged as estimates ("J"). All other LCS results were acceptable.

One liquid LCS was digested and analyzed for each of the cases in this report that contained water samples. The results were compared against the control limit of 80-120% percent as required by the USEPA CLP SOW 3/90 protocol and found to be acceptable.

5.6 PRECISION

5.6.1 Laboratory Duplicate Samples

The laboratory duplicate results measures the precision of the method by measuring a second aliquot of the sample that is treated the same way as the original.

The laboratory duplicate results fell outside the established QC limits for calcium in soil samples in SDG No. B05WP1 and all samples in SDG No. B05WW6. All associated samples were qualified as estimates "J".

The laboratory duplicate results fell outside the established QC limits for chromium in soil samples in SDG No. B05WP1, all samples in SDG No. B05WW6, and sample number B05WV6 in SDG No. B05WV6. All associated samples were qualified as estimates "J".

The laboratory duplicate results fell outside the established QC limits for lead in sample number B05WV6 in SDG No. B05WV6 and sample numbers B05WP5 and B05WV5 in SDG. No. B05WP5. All associated samples were qualified as estimates "J".

The laboratory duplicate results fell outside the established QC limits for magnesium in SDG No. B05WW6. All associated samples were qualified as estimates "J".

The laboratory duplicate results fell outside the established QC limits for manganese in SDG No. B05WW6. All associated samples were qualified as estimates "J".

The laboratory duplicate results fell outside the established QC limits for nickel in SDG No. B05WW6. All associated samples were qualified as estimates "J".

All other laboratory duplicate results were acceptable.

5.6.2 ICP Serial Dilution

The ICP serial dilution is used to determine whether significant physical or chemical interferences exist due to sample matrix. If sample concentration is $\geq$ 50 times the IDL for an analyte and the %D is outside the control limits the associated data must be qualified.

The ICP serial dilution results did not meet the QC limits for the following results:

- Zinc in all soil samples in SDG No. B05WP1 and all samples in SDG No. B05WV7.

All associated results were qualified as estimates "J".

All other ICP serial dilution results were acceptable.

5.7 FURNACE AA QUALITY CONTROL

The post-digestion analytical spike is analyzed to determine the extent of interference in the digestate matrix. When the results of the analytical spike analyses exceeds the control window of 85 to 115 percent recovery and the absorbance of the sample is greater than fifty percent of the analytical spike absorbance, then the sample must be reanalyzed using the MSA. The duplicate injections and the analytical spike recoveries establish the precision and accuracy of the individual GFAA determinations.

5.7.1 Duplicate Injections

All duplicate injection quality control requirements were met.

5.7.2 Analytical Spike Recoveries

For all samples whose analytical spike results were outside the 85 to 115 percent control limit, but whose absorbances are less than 50 percent of the analytical spike absorbance, the samples were flagged as an estimate "J".

The analytical spike recovery fell outside the established QC limits for arsenic in:

- Sample number B05WV1 in SDG No. B05WP1.

The analytical spike recovery fell outside the established QC limits for lead in:

- Sample number B05WP0 in SDG No. B05WN8.
- Sample numbers B05WP1 and B05WV1 in SDG No. B05WP1..

The analytical spike recovery fell outside the established QC limits for selenium in :

- Sample numbers B05WN9 and B05WP0 in SDG No. B05WN8.
- Sample numbers B05WT9, B05WV3 and B05WV4 in SDG No. B05WP1.
- Sample numbers B05WP5, B05WP7 and B05WV5 in SDG No. B05WP5.
- Sample numbers B05WV8, B05WW4 and B05WW5 in SDG No. B05WV6.
- Sample number B05WV7 in SDG No. B05WV7.

The analytical spike recovery fell outside the established QC limits for thallium in:

- Sample number B05WP0 in SDG No. B05WN8.

Due to an analytical spike recovery equal to zero, the selenium result in sample number B05WT8 in SDG No. B05WN8 was rejected and flagged "R".

5.8 ANALYTE QUANTITATION AND DETECTION LIMITS

Twenty percent of sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors.

The reviewer verified that the results and detection limits fell within the linear range of the instrument.

5.9 OVERALL ASSESSMENT AND SUMMARY

All samples were analyzed and reported under the 1990 CLP protocol (EPA 1990). Several inconsistencies and deviations from the protocol were observed primarily with data supplied by Roy F. Weston. They are as follows:

For ICAP analysis two sets of IDLs are included in each data package, one for instrument IC1 and one for instrument IC3. The raw data does not specify which ICAP instrument was used for the analysis run however results are being calculated and reported from both sets of IDLs as well as IDLs which do not appear on any

form provided. This affects results reported below the CRDL on Forms 1, 3, 5, 6 and 9. IDLs are also required to be performed and reported on a quarterly basis. This to is not always being done and many of the IDL results are past the quarterly deadline. The mercury IDL on form 10 is reported at 0.04 ug/L while the rest of the report uses an IDL of 0.01 ug/L to calculate the results. The IDL (form 10) needs to be updated and the laboratory must clearly specify which IDLs are used to calculate results.

CCV and CCB are required to be analyzed immediately after the ICV and ICB. ICAP, Mercury and Cyanide do not follow this protocol. For ICAP analysis a CCV and CCB were run after the initial interference checks and CRI. This is incorrect since the ICSA/AB and CRII are considered analytical samples and according to the CLP protocol a CCV and CCB must be run prior to any analytical samples. For mercury and cyanide the CCV and CCB were analyzed for after the first ten samples. Refer to Sections E-11 paragraph 2b and E-12 paragraph 4a of the USEPA CLP SOW 3/90 protocol.

Laboratory Control Sample (LCS) Solid: The solid LCSs digested and analyzed for in this report could not be verified as soils. Digestion logbook pages provided in the report show an LCS being digested at 2 ml of the ICV. According to the USEPA CLP SOW 390 protocol Section E-19 paragraph 8 the ICV can only be used for the aqueous LCS. The LCS-soil must be an actual solid sample provided by the EPA or a certified agent. A percent recovery range of 80-120% was used to calculate the acceptance limits for the solid LCS in this report, but are valid for the aqueous LCS only.

Significant figures: Results reported on Forms 5A and 6, matrix spike and duplicate results respectively, should be brought out to a full four decimal places and not rounded to one significant digit with three zeros added. Refer to Section B-27 of the USEPA CLP SOW 3/90.

All raw data must be labelled with the EPA (client) ID number. To date all reports have been labelled with the laboratory ID number only. Refer to Section B-10 of the USEPA CLP SOW 3/90.

Internal chain of custodies are not properly labelled with the sample IDs. Chain of custodies which are provided can not be verified as those belonging to the samples in the report. Refer to Sections F-2 paragraph 1.2 and F-3 paragraph 1.4 of the USEPA CLP SOW 3/90.

All other data is usable for all purposes.

INORGANIC ANALYSIS, SOIL MATRIX, (mg/Kg)

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case:	SDG: B05WN8																		
Sample Number		B05WN8		B05WN9		B05WP0		B05WT8											
Location		116-H-9		116-H-9		116-H-9		116-H-7											
Remarks																			
Sample Date		02/26/92		02/27/92		02/27/92		02/27/92											
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	74400		9340		5010		9070											
Antimony	60	80.10	UJ	5.90	UJ	6.20	UJ	6.40	UJ										
Arsenic	10	2.10	U	3.20	U	1.60	U	47.00											
Barium	200	672.00		72.50		73.50		94.90											
Beryllium	5	4.70		0.25		0.26		0.37											
Cadmium	5	10.60	U	0.75	U	1.10	U	0.75	U										
Calcium	5000	79000		6320		5150		5220											
Chromium	10	114.00		11.20		8.50		12.30											
Cobalt	50	86.40		13.40		6.90		9.20											
Copper	25	195.00		34.90		13.10		17.00											
Iron	100	184000		24200		13400		19000											
Lead	3	7.90		4.20		2.60	UJ	540.00											
Magnesium	5000	50000		6700		3640		4630											
Manganese	15	3050		280.00		214.00		325.00											
Mercury	0.2	0.10	U	0.09	U	0.09	U	0.09	U										
Nickel	40	132.00		28.00		8.00		11.80											
Potassium	5000	13000		600.00		916.00		1720											
Selenium	5	4.00	U	0.76	UJ	0.79	UJ	4.20	R										
Silver	10	12.90	UJ	0.95	UJ	0.99	UJ	1.00	UJ										
Sodium	5000	2010		721.00		271.00		182.00											
Thallium	10	0.59	UJ	0.57	UJ	0.59	UJ	0.63	UJ										
Vanadium	50	389.00		46.70		36.80		40.00											
Zinc	20	430.00		42.20		32.80		53.10											
Cyanide	10	5.10	U	5.10	U	4.90	U	5.20	U										

BLANK AND SAMPLE DATA SUMMARY

SDG: B05WN8	REVIEWER: LM			DATE: 10/27/92				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB	Arsenic	4.2			ug/L	21.0	42.0	B05WP0, B05WN8, B05WN9	U
CCB	Cadmium	3.2			ug/L	16.0	32.0	All	U

ACCURACY DATA SUMMARY

SDG: B05WN8	REVIEWER: LM	DATE: 10/27/92	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B05WN9S	Antimony	40.2	All	J
B05WN9S	Silver	67.1	All	J
B05WN9S	Thallium	129.7	All	J
B05WN9A	Selenium	45.0	B05WN9	J
B05WP0A	Lead	134.1	B05WP0	J
B05WP0A	Selenium	43.9	B05WP0	J
B05WP0A	Thallium	117.5	B05WP0	J
B05WT8A	Selenium	0.0	B05WT8	R

DATA QUALIFICATION SUMMARY

SDG: B05WN8	REVIEWER: LM	DATE: 10/27/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony	U	B05WP0, B05WN8, B05WN9	Lab blank
Cadmium	U	All	Lab blank
Antimony	J	All	Matrix spike outside control limits
Silver	J	All	Matrix spike outside control limits
Selenium	J	B05WN9	Analytical spike recovery
Lead	J	B05WP0	Analytical spike recovery
Selenium	J	B05WP0	Analytical spike recovery
Thallium	J	B05WP0	Analytical spike recovery
Selenium	R	B05WT8	Analytical spike recovery

INORGANIC ANALYSIS, SOIL MATRIX, (mg/Kg)

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case:	SDG: B05WP1																		
Sample Number		B05WP1		B05WT9		B05WV2		B05WV3		B05WV4									
Location		116-H-3		116-H-7		116-H-7		116-H-7		116-H-7									
Remarks																			
Sample Date		03/04/92		02/28/92		03/02/92		03/02/92		03/02/92									
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	5200		5330		5520		6400		5210									
Antimony	60	5.90	UJ	6.70	UJ	6.10	UJ	6.90	UJ	5.90	UJ								
Arsenic	10	1.30	U	6.20		2.80		1.80	U	1.60	U								
Barium	200	42.50		67.20		64.70		62.10		43.80									
Beryllium	5	0.22	U	0.24	U	0.25	U	0.25	U	0.21	U								
Cadmium	5	0.78	U	0.72	U	0.78	U	0.85	U	0.52	U								
Calcium	5000	4990	J	8620	J	7110	J	7220	J	3280	J								
Chromium	10	10.50	J	14.60	J	28.30	J	21.60	J	13.10	J								
Cobalt	50	9.20	U	7.50	U	7.10	U	8.50	U	6.80	U								
Copper	25	12.90		17.60		23.40		16.60		13.50									
Iron	100	15900		14800		14400		15700		13400									
Lead	3	2.10	J	10.90		5.90		3.80		2.40									
Magnesium	5000	3690		3520		3780		4550		3340									
Manganese	15	231.00		249.00		245.00		262.00		220.00									
Mercury	0.2	0.09	U	0.45		1.10		0.09	U	0.09	U								
Nickel	40	9.60		7.30	U	7.60	U	12.70		7.60									
Potassium	5000	739.00		692.00		778.00		927.00		583.00									
Selenium	5	3.80	UJ	4.50	UJ	0.81	UJ	4.20	UJ	0.80	UJ								
Silver	10	0.96	U	1.10	U	0.98	U	1.10	U	0.95	U								
Sodium	5000	403.00		291.00		233.00		283.00		405.00									
Thallium	10	0.38	U	0.45	U	0.40	U	0.42	U	0.40	U								
Vanadium	50	47.10		32.70		31.70		36.80		24.70									
Zinc	20	39.10	J	56.20	J	83.10	J	44.30	J	40.30	J								
Cyanide	10	5.10	U	5.80	U	5.20	U	5.30	U	4.70	U								

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B05WP1																				
Sample Number		B05WV1																			
Location		116-H-7																			
Remarks		EB																			
Sample Date		2/28/92																			
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	66.00	U																		
Antimony	60	31.00	UJ																		
Arsenic	10	3.40	J																		
Barium	200	1.00	U																		
Beryllium	5	1.00	U																		
Cadmium	5	1.00	U																		
Calcium	5000	92.00	UJ																		
Chromium	10	2.00	UJ																		
Cobalt	50	3.00	U																		
Copper	25	7.00																			
Iron	100	35.00	U																		
Lead	3	2.30	J																		
Magnesium	5000	69.00	U																		
Manganese	15	1.00	U																		
Mercury	0.2	0.20	U																		
Nickel	40	4.00	U																		
Potassium	5000	76.00	U																		
Selenium	5	4.00	UJ																		
Silver	10	5.00	U																		
Sodium	5000	210.00																			
Thallium	10	2.00	U																		
Vanadium	50	3.00	U																		
Zinc	20	11.00	UJ																		
Cyanide	10	10.00	U																		

EB = Equipment Blank

ACCURACY DATA SUMMARY

SDG: B05WP1	REVIEWER: SC	DATE: 10/26/92	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B05WV2	Antimony	56.3	All soil	J
B05WV2	Selenium	49.6	All soil	J

PRECISION DATA SUMMARY

SDG: B05WP1	REVIEWER: SC	DATE: 10/26/92	PAGE 1 OF 1		
COMMENTS:					
COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Chromium	B05WV2	B05WV2D	37.1	All soil	J
Calcium	B05WV2	B05WV2D	55.3	All soil	J
Zinc	B05WV2L	B05WV2	11.2	All soil	J

DATA QUALIFICATION SUMMARY

SDG: B05WP1	REVIEWER: SC	DATE: 10/26/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony	J	All soil	Matrix spike
Selenium	J	All soil	Matrix spike
Calcium	J	All soil	Lab duplicate
Chromium	J	All soil	Lab duplicate
Selenium	J	B05WV2	MSA
Zinc	J	All soil	ICP serial
Selenium	J	B05WT9, B05WV3, B05WV4	GFAA QC
Arsenic	J	B05WV1	GFAA QC
Lead	J	B05WP1, B05WV1	GFAA QC

INORGANIC ANALYSIS, SOIL MATRIX, (mg/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B05WP5																				
Sample Number		B05WP5		B05WV5																	
Location		116-H-3		116-H-2																	
Remarks																					
Sample Date		03/05/92		03/09/92																	
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	4280		6710																	
Antimony	60	1.60	UJ	1.70	UJ																
Arsenic	10	1.10		37.90																	
Barium	200	36.70		72.30																	
Beryllium	5	0.52	U	0.77	U																
Cadmium	5	0.20	U	0.21	U																
Calcium	5000	4700		4650																	
Chromium	10	10.20		16.00																	
Cobalt	50	7.00		7.70																	
Copper	25	22.50		19.00	U																
Iron	100	13500		15800																	
Lead	3	8.60	J	187.00	J																
Magnesium	5000	3320		4120																	
Manganese	15	214.00	J	278.00	J																
Mercury	0.2	0.09	U	0.10	U																
Nickel	40	8.90		10.80																	
Potassium	5000	562.00		1320																	
Selenium	5	0.75	R	4.10	R																
Silver	10	0.39	U	0.42	U																
Sodium	5000	277.00		179.00																	
Thallium	10	0.57	U	0.61	U																
Vanadium	50	32.10		32.00																	
Zinc	20	26.20		48.70																	
Cyanide	10	4.80	U	5.20	U																

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B05WP5																				
Sample Number		B05WP7																			
Location		116-H-3																			
Remarks		EB																			
Sample Date		03/05/92																			
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	45.70	U																		
Antimony	60	8.00	U																		
Arsenic	10	2.00	U																		
Barium	200	4.00	U																		
Beryllium	5	1.00	U																		
Cadmium	5	1.40	U																		
Calcium	5000	321.00																			
Chromium	10	4.00	U																		
Cobalt	50	3.00	U																		
Copper	25	5.10	U																		
Iron	100	11.00	U																		
Lead	3	3.00	U																		
Magnesium	5000	49.00	U																		
Manganese	15	1.00	U																		
Mercury	0.2	0.20	U																		
Nickel	40	4.00	U																		
Potassium	5000	130.00	U																		
Selenium	5	4.00	J																		
Silver	10	2.00	U																		
Sodium	5000	705.00																			
Thallium	10	3.00	U																		
Vanadium	50	2.50	U																		
Zinc	20	4.00	U																		
Cyanide	10	10.00	U																		

EB = Equipment Blank

BLANK AND SAMPLE DATA SUMMARY

SDG: B05WP5	REVIEWER: LM			DATE: 2/5/93				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB	Aluminum	30.5			ug/L	152.5	305.0	B05WP7	U
CCB	Barium	5.0			ug/L	25.0	50.0	B05WP7	U
CCB	Beryllium	2.1			ug/L	10.5	21.0	B05WP7, B05WP5, B05WV5	U
CCB	Cadmium	2.2			ug/L	11.0	22.0	B05WP7, B05WP5, B05WV5	U
CCB	Copper	18.9			ug/L	94.5	189.0	B05WP7, B05WV5	U
ICB	Iron	-27.9			ug/L	-139.5	-279.0	B05WP7	U
CCB	Vanadium	3.2			ug/L	16.0	32.0	B05WP7	U
PBW	Antimony	-12.3			ug/L	-61.5	-123.0	B05WP7	U
PBW	Lead	2.8			ug/L	14.0	28.0	B05WP7	U

ACCURACY DATA SUMMARY

SDG: B05WP5	REVIEWER: LM	DATE: 2/5/93	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B05WP5S	Antimony	56.2	B05WP5,B05WV5	J
B05WP5S	Lead	-66.8	B05WP5,B05WV5	J
B05WP5S	Manganese	127.4	B05WP5,B05WV5	J
B05WP5S	Selenium	0.0	B05WP5,B05WV5	R
B05WP5A	Selenium	47.1	B05WP5	J
B05WP7A	Selenium	50.6	B05WP7	J
B05WV5A	Selenium	82.0	B05WV5	J

PRECISION DATA SUMMARY

SDG: B05WP5	REVIEWER: LM	DATE: 2/5/93		PAGE 1 OF 1	
COMMENTS:					
COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Lead	B05WP5	B05WP5D	108.5	B05WP5, B05WV5	J

DATA QUALIFICATION SUMMARY

SDG: B05WP5	REVIEWER: LM	DATE: 2/5/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aluminum	U	B05WP5	Lab Blank
Antimony	U	B05WP7	Lab Blank
Barium	U	B05WP7	Lab Blank
Beryllium	U	B05WP5,B05WP7,B05WV5	Lab Blank
Cadmium	U	B05WP5,B05WP7,B05WV5	Lab Blank
Copper	U	B05WP5,B05WP7	Lab Blank
Iron	U	B05WP7	Lab Blank
Lead	U	B05WP7	Lab Blank
Vanadium	U	B05WP7	Lab Blank
Antimony	J	B05WP5,B05WV5	Matrix spike
Lead	J	B05WP5,B05WV5	Matrix spike
Manganese	J	B05WP5,B05WV5	Matrix spike
Selenium	R	B05WP5,B05WV5	Matrix spike
Selenium	J	B05WP5,B05WP7,B05WV5	GFAA spike
Lead	J	B05WP5,B05WV5	Duplicate RPD

INORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																			
Laboratory: TMA																			
Case:	SDG: B05WV6																		
Sample Number		B05WV6		B05WV8		B05WV9		B05WW0		B05WW4		B05WW5							
Location		116-H-1		116-H-1		116-H-1		116-H-1		116-H-1		116-H-2							
Remarks		SPLIT																	
Sample Date		03/09/92		03/09/92		03/10/92		03/10/92		03/11/92		03/13/92							
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	7500		5550		4800		5560		5720		4560							
Antimony	60	1.60	UJ	1.60	UJ	1.60	UJ	1.50	UJ	1.60	UJ	1.60	UJ						
Arsenic	10	25.30	J	7.30	J	1.80	UJ	1.20	UJ	1.20	UJ	1.40	UJ						
Barium	200	74.50		59.60		52.90		56.80		72.50		57.60							
Beryllium	5	0.56	U	0.55	U	0.20	U	0.54	U	0.45	U	0.32	U						
Cadmium	5	0.20	U	0.20	U	0.20	U	0.19	U	0.20	U	0.19	U						
Calcium	5000	5520		4120		3180		4330		4520		7890							
Chromium	10	18.90	J	17.90		29.60		12.50		10.60		7.60							
Cobalt	50	8.30		7.40		6.40		8.10		9.90		6.90							
Copper	25	19.50		19.30		20.50		17.60		16.90		13.60							
Iron	100	16900		15800		12700		15000		18700		12800							
Lead	3	145.00	J	36.90	J	82.10	J	2.80	J	2.50	J	2.90	J						
Magnesium	5000	4630		4210		3420		3940		4190		3330							
Manganese	15	292.00		252.00		215.00		242.00		266.00		211.00							
Mercury	0.2	0.10	U	0.09	U	0.09	U	0.09	U	0.10	U	0.09	U						
Nickel	40	11.50		9.30		7.90		9.60		9.00		7.40							
Potassium	5000	1270		707.00		509.00		575.00		946.00		766.00							
Selenium	5	0.82	UJ	0.83	UJ	4.10	UJ	4.20	UJ	0.77	UJ	0.78	UJ						
Silver	10	0.40	U	0.40	U	0.40	U	0.39	U	0.40	U	0.39	U						
Sodium	5000	207.00		205.00		249.00		399.00		480.00		277.00							
Thallium	10	0.62	U	0.62	U	0.62	U	0.63	U	0.58	U	0.58	U						
Vanadium	50	35.80		32.90		32.80		38.20		51.00		32.20							
Zinc	20	53.10		45.10		38.60		30.50		39.10		31.70							
Cyanide	10	5.30	U	5.20	U	5.10	U	5.00	U	4.70	U	4.70	U						

BLANK AND SAMPLE DATA SUMMARY

SDG: B05WV6	REVIEWER: LM			DATE: 10/27/92				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
ICB	Antimony	8.6			ug/L	43.0	86.0	All	U
ICB	Arsenic	2.0			ug/L	10.0	20.0	B05WV9, B05WW0, B05WW4, B05WW5	U
CCB	Beryllium	1.1			ug/L	5.5	11.0	All	U
CCB	Silver	2.5			ug/L	12.5	25.0	All	U

ACCURACY DATA SUMMARY

SDG: B05WV6	REVIEWER: LM	DATE: 10/27/92	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B05WV9S	Antimony	65.1	All	J
B05WV9S	Selenium	44.2	All	J
LCS	Arsenic	139.8	All	J
B05WV8A	Selenium	42.7	B05WV8	J
B05WW4A	Selenium	61.2	B05WW4	J
B05WW5A	Selenium	47.2	B05WW5	J

PRECISION DATA SUMMARY

SDG: B05WV6	REVIEWER: LM	DATE: 10/27/92		PAGE 1 OF 1	
COMMENTS:					
COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Lead	B05WV9	B05WV9D	178.9	All	J
Chromium	B05WV6	B05WV7	21.7	B05WV6	J
Lead	B05WV6	B05WV7	20.5	B05WV6	J

DATA QUALIFICATION SUMMARY

SDG: B05WV6	REVIEWER: LM	DATE: 10/27/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony	U	All	Lab blank
Arsenic	U	B05WV9, B05WW0, B05WW4, B05WW5	Lab blank
Beryllium	U	All	Lab blank
Silver	UJ	All	Lab blank
Antimony	UJ	All	Matrix spike recovery
Selenium	UJ	All	Matrix spike recovery
Arsenic	J	All	LCS out
Lead	J	All	Duplicate RPD out
Selenium	UJ	B05WV8, B05WW4, B05WW5	Analytical spike reocvery
Chromium	J	B05WV6	Split sample RPD out
Lead	J	B05WV6	Split sample RPD out

INORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case:	SDG: B05WV7																				
Sample Number		B05WV7																			
Location		116-H-1																			
Remarks		SPLIT																			
Sample Date		03/09/92																			
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	6890																			
Antimony	60	4.60	U																		
Arsenic	10	27.60	J																		
Barium	200	66.00																			
Beryllium	5	0.46																			
Cadmium	5	0.80	U																		
Calcium	5000	4960																			
Chromium	10	23.50	J																		
Cobalt	50	9.30																			
Copper	25	11.80																			
Iron	100	17900																			
Lead	3	118.00	J																		
Magnesium	5000	3930																			
Manganese	15	275.00																			
Mercury	0.2	0.05	U																		
Nickel	40	13.90																			
Potassium	5000	1160																			
Selenium	5	0.40	UJ																		
Silver	10	0.60	R																		
Sodium	5000	249.00	U																		
Thallium	10	0.40	U																		
Vanadium	50	40.80																			
Zinc	20	52.70	J																		
Cyanide	10	0.50	U																		

BLANK AND SAMPLE DATA SUMMARY

SDG: B05WV7	REVIEWER: LM			DATE: 10/26/92				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
PBS	Sodium	842.6			ug/L	4213.0	8426.0	B05WV7	U

ACCURACY DATA SUMMARY

SDG: B05WV7	REVIEWER: LM	DATE: 10/26/92	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B05WV7S	Arsenic	0.0	B05WV7	J
B05WV7S	Lead	760.0	B05WV7	J
B05WV7S	Selenium	72.0	B05WV7	J
B05WV7S	Silver	28.0	B05WV7	R
B05WV7A	Selenium	80.0	B05WV7	J

PRECISION DATA SUMMARY

SDG: B05WV7	REVIEWER: LM	DATE: 10/26/92		PAGE 1 OF 1	
COMMENTS:					
COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Zinc	B05WV7	B05WV7	20.2	B05WV7	J
Chromium	B05WV7	B05WV6	21.7	B05WV7	J
Lead	B05WV7	B05WV6	20.5	B05WV7	J

DATA QUALIFICATION SUMMARY

SDG: B05WV7	REVIEWER: LM	DATE: 10/26/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Sodium	U	B05WV7	Lab blank
Arsenic	J	B05WV7	Matrix spike recovery
Lead	J	B05WV7	Matrix spike recovery
Selenium	J	B05WV7	Matrix spike recovery
Silver	R	B05WV7	Matrix spike recovery
Zinc	J	B05WV7	Serial dilution
Selenium	J	B05WV7	Analytical spike recovery
Chromium	J	B05WV7	Split sample RPD out
Lead	J	B05WV7	Split sample RPD out

INORGANIC ANALYSIS, SOIL MATRIX, (ug/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case:	SDG: B05WW6																				
Sample Number		B05WW6		B05WW7																	
Location		116-H-2		116-H-2																	
Remarks		DUP		DUP																	
Sample Date		03/16/92		03/16/92																	
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	5640		4900																	
Antimony	60	1.60	UJ	1.60	UJ																
Arsenic	10	2.00	U	2.10	U																
Barium	200	55.30	J	69.90	J																
Beryllium	5	0.35	U	0.34	U																
Cadmium	5	0.20	U	0.19	U																
Calcium	5000	11000	J	9920	J																
Chromium	10	17.50	J	19.00	J																
Cobalt	50	7.70		7.10																	
Copper	25	18.40		15.80																	
Iron	100	14700		12600																	
Lead	3	4.00		3.30																	
Magnesium	5000	4720	J	4530	J																
Manganese	15	246.00	J	212.00	J																
Mercury	0.2	0.09	U	0.09	U																
Nickel	40	19.20	J	24.40	J																
Potassium	5000	916.00	J	749.00	J																
Selenium	5	3.90	UJ	4.00	U																
Silver	10	0.39	U	0.39	U																
Sodium	5000	229.00		193.00																	
Thallium	10	0.79	U	0.79	U																
Vanadium	50	34.60		30.40																	
Zinc	20	35.70		30.90																	
Cyanide	10	0.52	U	0.50	U																

DUP = Duplicate

BLANK AND SAMPLE DATA SUMMARY

SDG: B05WW6	REVIEWER: LM			DATE: 10/27/92				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
ICB	Antimony	11.1			ug/L	55.5	111.0	B05WW6, B05WW7	U
ICB	Arsenic	2.5			ug/L	12.5	25.0	B05WW6, B05WW7	U
CCB	Beryllium	1.8			ug/L	9.0	18.0	B05WW6, B05WW7	U
CCB	Cadmium	1.4			ug/L	7.0	14.0	B05WW6, B05WW7	U
CCB	Silver	2.2			ug/L	11.0	22.0	B05WW6, B05WW7	U

ACCURACY DATA SUMMARY

SDG: B05WW6	REVIEWER: LM	DATE: 10/27/92	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B05WW7S	Antimony	49.5	All	J

PRECISION DATA SUMMARY

SDG: B05WW6	REVIEWER: SC	DATE: 10/27/92		PAGE 1 OF 1	
COMMENTS:					
COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Calcium	B05WW7	B05WW7D	30.7	B05WW6,B05WW7	J
Chromium	B05WW7	B05WW7D	89.5	B05WW6,B05WW7	J
Magnesium	B05WW7	B05WW7D	34.8	B05WW6,B05WW7	J
Manganese	B05WW7	B05WW7D	21.9	B05WW6,B05WW7	J
Nickel	B05WW7	B05WW7D	45.0	B05WW6,B05WW7	J
Barium	B05WW6	B05WW7	23.3	B05WW6,B05WW7	J
Potassium	B05WW6	B05WW7	23.8	B05WW6,B05WW7	J

DATA QUALIFICATION SUMMARY

SDG: B05WW6	REVIEWER: LM	DATE: 10/27/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony	U	B05WW6,B05WW7	Lab blank contamination
Arsenic	U	B05WW6,B05WW7	Lab blank contamination
Beryllium	U	B05WW6,B05WW7	Lab blank contamination
Cadmium	U	B05WW6,B05WW7	Lab blank contamination
Silver	U	B05WW6,B05WW7	Lab blank contamination
Calcium	J	B05WW6,B05WW7	Duplicate RPD
Chromium	J	B05WW6,B05WW7	Duplicate RPD
Magnesium	J	B05WW6,B05WW7	Duplicate RPD
Manganese	J	B05WW6,B05WW7	Duplicate RPD
Nickel	J	B05WW6,B05WW7	Duplicate RPD
Selenium	J	B05WW6	MSA corr. <0.995
Barium	J	B05WW6,B05WW7	Field Duplicate RPD out
Potassium	J	B05WW6,B05WW7	Field Duplicate RPD out

WELL AND SAMPLE INFORMATION				SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	RADIOCHEMISTRY
116-H-9	B05WN8	S	2/26/92	12-3
	B05WN9	S	2/27/92	12-3
	B05WP0	S	2/27/92	12-3
116-H-3	B05WP1	S	3/04/92	12-3
	B05WP5	S	3/05/92	12-3
	B05WP7	W	3/05/92	12-5
116-H-7	B05WT8	S	2/27/92	12-3
	B05WT9	S	2/28/92	12-3
	B05WV1	W	2/28/92	12-5
	B05WV2	S	3/02/92	12-3
	B05WV3	S	3/02/92	12-3
	B05WV4	S	3/02/92	12-3
116-H-1	B05WV5	S	3/09/92	12-4
	B05WV6	S	3/09/92	12-4
	B05WV7	S	3/09/92	12-6
	B05WV8	S	3/09/92	12-4
	B05WV9	S	3/10/92	12-4
	B05WW0	S	3/10/92	12-4
	B05WW4	S	3/11/92	12-4
116-H-2	B05WW5	S	3/13/92	12-4
	B05WW6	S	3/16/92	12-6
	B05WW7	S	3/16/92	12-6

6.0 GROSS ALPHA AND GROSS BETA DETERMINATION DATA VALIDATION

6.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted and found to be complete:

B05WN8 B05WV7

6.2 HOLDING TIMES

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for this analysis is six months.

All holding times were acceptable.

6.3 INSTRUMENT CALIBRATION AND PERFORMANCE

Instrument calibration is performed to establish that the gas proportional counter used for gross alpha and gross beta determination is capable of producing acceptable and reliable analytical data. The initial calibration was performed according to manufacturer's recommendations and consists of an instrument efficiency determination as a function of alpha or beta particle energy, and as a function of the mass of material submitted for counting. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All gross alpha sample results in both data packages were rejected and flagged "R" because efficiencies were below the QC minimum of 20%.

All gross beta sample results in SDG No. B05WV7 were rejected and flagged "R" because the associated efficiencies were below the QC minimum of 20%.

All other gross beta results were acceptable.

6.4 ACCURACY

Accuracy was evaluated by analyzing soil or distilled water samples spiked with known amounts of alpha or beta emitting

radionuclides. The sample activity as determined by sample analysis is compared to the known activity to assess accuracy. Acceptable accuracy of spiked sample data must fall within a range of 80 to 120 percent. If spiked sample results were outside this range, the associated data was qualified as estimated (J/UJ).

All gross alpha sample results in SDG No. B05WV7 were rejected and flagged "R" since the associated laboratory control sample recoveries (matrix spike results) were out of specification.

All gross beta results in all samples except B05WV1 in SDG No. B05WN8 have been qualified as estimated (J) since associated LCS recoveries were out of specification.

All other accuracy results were acceptable.

6.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. Replicates with activities greater than five times the LLD and with an RPD less than 35 percent are acceptable. If duplicate activities are both <5xLLD, a control limit of 2xLLD is used. If replicate values are both below the LLD, no control limit is applicable. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects (J) or estimated non-detects (UJ).

All precision results are acceptable.

6.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination.

All results are acceptable, including those for field and equipment blanks.

6.7 COMPOUND QUANTITATION AND REPORTED DETECTION LIMITS

Compound quantitation and detection limits were recalculated for all samples in each data package to verify their accuracy.

All compound quantitation and reported detection limits for all samples are acceptable.

6.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument continuing calibration information and QC data indicates that instrument performance was inadequate for these analyses. As noted in the previous sections, all gross alpha data in each data package were rejected (R) because efficiencies determined in calibration were less than the QC minimum of 20%. Rejected data are unusable for all purposes. The gross beta results in several samples in SDG No. B05WN8 were qualified as estimates and flagged since the associated LCS recoveries were out of specification "J". All other QC results were acceptable and usable for all purposes.

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7.0 ALPHA SPECTROSCOPY DATA VALIDATION

7.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted and found to be complete:

B05WN8 B05WV7

7.2 HOLDING TIMES

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for this analysis is six months.

Holding times were acceptable for all samples.

7.3 INSTRUMENT CALIBRATION AND PERFORMANCE

Instrument calibration is performed to establish that the alpha spectroscopy system used is capable of producing acceptable and reliable analytical data. The initial calibration was performed according to manufacturer's recommendations and consists of an instrument efficiency determination for each alpha radionuclide region of interest and system resolution as measured by the full-width at half maximum for each peak. Initial calibration was performed for each counting geometry used during the analysis of Westinghouse Hanford samples. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All calibration data were acceptable.

7.4 ACCURACY

Accuracy was evaluated by analyzing soil or distilled water samples spiked with known amounts of alpha emitting radionuclides. The sample activity as determined by sample analysis is compared to the known activity to assess accuracy. The acceptable matrix spike or Laboratory Control Sample recovery range is 80 to 120 percent, while that for radiometric yields is 30 to 105%. Spike sample results outside the above ranges resulted in qualification of the associated data as estimated (J/UJ).

- All alpha spectroscopy results in SDG No. B05WV7 were rejected and flagged "R" since the associated radiometric yields were below the QC minimum.

- All Uranium-238, Isotopic Plutonium, and Americium-241 sample results, except for sample numbers B05WP7 and B05WV1 in SDG No. B05WN8, have been qualified as estimated (J) since the associated LCS recoveries were out of specification.

- All Uranium-235 sample results, except sample numbers B05WP7 and B05WV1 in SDG No. B05WV8, have been rejected and flagged "R" because the associated LCS recoveries were grossly out of specification.

All other accuracy results were acceptable.

7.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate samples. Replicates with a RPD less than 35 percent are acceptable. If duplicate activities are both <5xLLD, a control limit of 2xLLD is used. If replicate values are both below the LLD, no control limit is applicable. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects (J) or estimated non-detects (UJ).

Since the associated RPD was greater than 35%, all Uranium-238 results in SDG No. B05WN8 were qualified as estimated (J).

All other precision results were acceptable.

7.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination.

All blank results were acceptable. Equipment blanks showed minimal to negligible contamination.

7.7 COMPOUND QUANTITATION AND REPORTED DETECTION LIMITS

Compound quantitations and detection limits were recalculated for all samples in each data delivery package to verify their accuracy. Results below the MDA were qualified as non-detects (U) except in cases where the MDA was greater than the contract required detection limit. In the latter situation, non-detects were qualified as estimated (UJ).

All compound quantitation and reported detection limits are acceptable.

7.8 OVERALL ASSESSMENT AND SUMMARY

A complete review of all available QC and calibration data indicates that overall system performance is adequate. All Uranium-238 results in sample number B05WN8 were estimated due to high RPD values. The results for Americium-241, Plutonium, and Uranium were affected by poor accuracy in SDG No. B05WV7. Associated results were rejected and flagged "R". Plutonium, Uranium-238, and Americium results were qualified as estimated in SDG No. B05WN8 because the associated LCS recoveries were out of specification. Data qualified as estimated is valid and usable for limited purposes only. Uranium-235 sample results in SDG No. B05WV8 were rejected and flagged "R" because the associated LCS recoveries were out of specification. Rejected results are unusable for all purposes. All other QC and calibration data is acceptable and associated sample results were usable for all purposes.

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8.0 GAMMA SPECTROSCOPY DATA VALIDATION

8.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted and found to be complete:

B05WN8 B05WV7

8.2 HOLDING TIMES

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for this analysis is six months.

Holding times were acceptable.

8.3 INSTRUMENT CALIBRATION AND PERFORMANCE

Instrument calibration is performed to establish that the gamma spectroscopy system used is capable of producing acceptable and reliable analytical data. The initial calibration was performed according to manufacturers recommendations and consists of an instrument efficiency determination for each gamma radionuclide region of interest, system resolution, as measured by the full-width at half maximum for each peak. Initial calibration was performed for each counting geometry used during the analysis of Westinghouse Hanford samples. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

Associated calibration data for all gamma spectroscopy results are acceptable.

8.4 ACCURACY

Accuracy was evaluated by analyzing soil or distilled water samples spiked with known amounts of gamma emitting radionuclides. The sample activity as determined by sample analysis is compared to the known activity to assess accuracy. The acceptable spiked recovery range is 80 to 120 percent. If spiked sample results were outside this range the associated data was qualified as estimated (J/UJ).

All gamma spectroscopy results, except for results associated with sample numbers B05WP7 and B05WV1 in SDG No. B05WN8 were qualified as estimated (J) since the associated LCS recoveries were out of specification.

All other accuracy results were acceptable.

8.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. Replicates with a RPD less than 35 percent are acceptable. If duplicate activities are both <5xLLD, a control limit of 2xLLD is used. If replicate values are both below the LLD, no control limit is applicable. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects (J) or estimated non-detects (UJ).

All precision results were acceptable.

8.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results may be due to laboratory reagent, sample container, or detector contamination.

No blank data was provided for any of the samples in SDG No. B05WV7; therefore, all associated results were qualified as estimated (J).

All other blank sample results were acceptable, including those for equipment blanks.

8.7 COMPOUND QUANTITATION AND REPORTED DETECTION LIMITS

Compound quantitations and detection limits were recalculated for all samples in each data delivery package to verify their accuracy. Results below the MDA were qualified as non-detects (U) except in cases where the MDA was greater than the contract required detection limit. In these situations, non-detects were qualified as estimated (UJ).

All compound quantitation and detection limits and results are reported properly.

8.8 OVERALL ASSESSMENT AND SUMMARY

A review of continuing calibration and QC data indicates that instrument performance was adequate for these analyses. With the exception of the missing blank data in SDG No. B05WV7, all system performance results are acceptable. All results associated with this data packages were flagged as estimates ("J" or "UJ"). In addition, several samples in SDG No. B05WN8 were qualified as estimated since the associated LCS results were out of specification. Data qualified as estimated (J/UJ) is valid and usable for limited purposes only. All other data is considered to be valid within the detection limits and standard errors associated with the method and usable for limited purposes only.

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9.0 STRONTIUM-90 DETERMINATION DATA VALIDATION

9.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted and found to be complete:

B05WN8 B05WV7

9.2 HOLDING TIMES

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for this analysis is six months.

All holding times were acceptable.

9.3 INSTRUMENT CALIBRATION AND PERFORMANCE

Instrument calibration is performed to establish that the low background counting system used for Strontium-90 determination is capable of producing acceptable and reliable analytical data. The initial calibration was performed according to manufacturer's recommendations and consists of an instrument detection efficiency determination. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All calibration results were acceptable.

9.4 ACCURACY

All spike recoveries should be within the specified QC range of 80 to 120 percent, while all radiotraced samples should show a radiometric yield or recovery between 30 and 105%. Spiked sample results outside the above ranges resulted in qualification of the associated data as estimated.

All Strontium-90 results, except for results associated with sample numbers B05WP7 and B05WV1 in SDG No. B05WN8 were qualified as estimated (J) since the associated LCS recoveries were out of specification.

All other accuracy results were acceptable.

9.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. Replicates with an RPD less than 35 percent are acceptable. If duplicate activities are both <5xLLD, a control limit of 2xLLD is used. If replicate values are both below the LLD, no control limit is applicable. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects (J) or estimated non-detects (UJ).

All precision results were acceptable.

9.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results may be due to laboratory reagent, sample container, or detector contamination.

All blank results were acceptable.

9.7 COMPOUND QUANTITATION AND REPORTED DETECTION LIMITS

Compound quantitation and detection limits were recalculated for all samples in each data delivery package to verify their accuracy. Results below the MDA were qualified as non-detects (U) except in cases where the MDA is greater than the contract required detection limit. In these situations, non-detects were qualified as estimated (UJ).

All compound quantitation and reported detection limits and sample results have been properly reported and transcribed.

9.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate for these analyses. With the exception of minor LCS deficiencies in SDG No. B05WN8, overall system performance was adequate. In cases where the sample results were affected by the above accuracy problem, the associated data were qualified as estimated. Data qualified in this manner are valid and usable for limited purposes only. All other results are usable for all purposes.

10.0 TECHNETIUM-99 DATA VALIDATION

10.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted and found to be complete:

B05WN8 B05WV7

10.2 HOLDING TIMES

Holding times are calculated from Chain of Custody forms to determine the validity of the results. The maximum holding time for this analysis is six months.

All holding times were acceptable.

10.3 INSTRUMENT CALIBRATION AND PERFORMANCE

Instrument calibration is performed to establish that the low level beta counting system used is capable of producing acceptable and reliable analytical data. The initial calibration was performed according to manufacturers recommendations and consists of an instrument efficiency determination and a self-absorption curve for the radionuclide of interest. In addition, the detection method employs a National Technical Information System (NTIS) traceable Technetium-99m internal reference standard. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All calibration results were acceptable.

10.4 ACCURACY

Accuracy was evaluated by analyzing soil or distilled water samples spiked with known amounts of Technetium-99, a gamma emitting radionuclide. The sample activity as determined by sample analysis is compared to the known activity to assess accuracy. Acceptable accuracy of spiked sample data must fall within a range of 80 to 120 percent, while radiotraced yields and recoveries must fall between 30 and 105%. Spike sample results outside the above ranges resulted in qualification of the associated data as estimated (J/UJ).

All Technetium-99 results, except for results associated sample numbers B05WP7 and B05WV1 in SDG No. B05WN8, were qualified as estimated (J) since the associated LCS recoveries were out of specification.

Accuracy results for all other samples were acceptable.

10.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. Replicates with a RPD less than 35 percent are acceptable. If duplicate activities are both <5xLLD, a control limit of 2xLLD is used. If replicate values are both below the LLD, no control limit is applicable. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects (J) or estimated non-detects (UJ).

All precision results in all of the data packages were acceptable.

10.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results may be due to laboratory reagent, sample container, or detector contamination.

All blank results were acceptable. Equipment blanks showed minimal to negligible contamination.

10.7 COMPOUND QUANTITATION AND REPORTED DETECTION LIMITS

Compound quantitations and detection limits were recalculated for all samples in each data delivery package to verify their accuracy. Results below the MDA were qualified as non-detects (U) except in cases where the MDA was greater than the contract required detection limit. In these cases, non-detects were qualified as estimated (UJ).

All compound quantitation and reported detection limits have been properly calculated and reported for the sample analyses at hand.

10.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate

for these analyses. Technetium-99 results in SDG No. B05WN8 were qualified as estimated due to problems with LCS recoveries. Data qualified in this manner is valid and usable for limited purposes only. All other data is valid and usable for all purposes.

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11.0 CARBON-14 DETERMINATION DATA VALIDATION

11.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted and found to be complete:

B05WN8 B05WV7

11.2 HOLDING TIMES

Holding times for Carbon-14 liquid scintillation analyses were assessed to ascertain whether the holding time requirements were met by the laboratory. Samples must be analyzed within six months of collection.

All holding times were acceptable.

11.3 INSTRUMENT CALIBRATION AND PERFORMANCE

Instrument calibration is performed to establish that the low background liquid scintillation counting system used for Carbon-14 determination is capable of producing acceptable and reliable analytical data. The initial calibration was performed according to manufacturer's recommendations and consists of an instrument efficiency determination for the radionuclide at hand. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All calibration results were acceptable.

11.4 ACCURACY

All spike recoveries should be within the specified QC range of 80 to 120 percent, while all radiometric yields should fall within the range of 30 to 105%. Spiked sample results outside the above ranges resulted in qualification of the associated data as estimated (J/UJ).

- All Carbon-14 results, except for results associated with sample numbers B05WP7 and B05WV1 in SDG No. B05WN8, were qualified as estimated (J) since the associated LCS recoveries were out of specification.

- Radiochemical yields were out of specification for samples in SDG No. B05WV7. All associated results were qualified as estimated (J).

All other accuracy results were acceptable.

11.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. Replicates with a RPD less than 35 percent are acceptable. If duplicate activities are both <5xLLD, a control limit of 2xLLD is used. If replicate values are both below the LLD, no control limit is applicable. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects (J) or estimated non-detects (UJ).

All Carbon-14 results in SDG No. B05WN8 were qualified as estimated (J) since the associated RPD was out of specification.

All other precision results were acceptable.

11.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results may be due to laboratory reagent, sample container, or detector contamination.

All blank results are acceptable. Equipment blank results showed minimal to negligible contamination.

11.7 COMPOUND QUANTITATION AND REPORTED DETECTION LIMITS

Compound quantitation and detection limits were recalculated for all samples in each data delivery package to verify their accuracy. Results below the MDA were qualified as non-detects (U) except in cases where the MDA was greater than the contract required detection limit. In these situations, non-detects were qualified as estimated (UJ).

All compound quantitation and reported detection limits and sample results have been properly reported and transcribed.

11.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument performance and calibration reveals that the overall system performance is adequate. Due to minor

LCS deficiencies, several samples in SDG No. B05WN8 were qualified as estimated and flagged "J". Radiochemical yields were outside of QC limits for all samples in SDG No. B05WV7. The associated results were qualified as estimates (J). C-14 results in SDG No. B05WN8 were qualified as estimates and flagged "J" since the associated RPD recovery exceeded QC limits. All other QC and calibration results were acceptable and usable for all purposes.

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12.0 TRITIUM DETERMINATION DATA VALIDATION

12.1 DATA PACKAGE COMPLETENESS

The following data package (SDG No.) was submitted:

B05WN8

The data package was found to be complete.

12.2 HOLDING TIMES

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for this analysis is six months.

All holding times were acceptable.

12.3 INSTRUMENT CALIBRATION AND PERFORMANCE

Instrument calibration is performed to establish that the low background liquid scintillation counting system used for tritium determination is capable of producing acceptable and reliable analytical data. The initial calibration was performed according to manufacturer's recommendations and consists of an instrument efficiency determination, and background tritium measurements for uncontaminated water. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All instrument performance and calibration data were acceptable.

12.4 ACCURACY

All spike recoveries should be within the specified QC range of 80 to 120 percent, while all radiometric yields should fall within the range of 30 to 105%. Spiked sample results outside the above ranges resulted in qualification of the associated data as estimated (J/UJ).

All accuracy results were acceptable.

12.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. Replicates with a RPD less than 35 percent are acceptable. If duplicate activities are both <5xLLD, a control limit of 2xLLD is used. If replicate values are both below the LLD, no control limit is applicable. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects (J) or estimated non-detects (UJ).

All precision results were acceptable.

12.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results may be due to laboratory reagent, sample container, or detector contamination.

All blank data results were acceptable. Equipment blank results showed minimal to negligible contamination.

12.7 COMPOUND QUANTITATION AND REPORTED DETECTION LIMITS

Compound quantitation and detection limits were recalculated for all samples in each data delivery package to verify their accuracy. Results below the MDA were qualified as non-detects (U) except in cases where the MDA was greater than the contract required detection limit. In these situations, non-detects were qualified as estimated (UJ).

All compound quantitation and reported detection limits and sample results have been properly reported and transcribed.

12.8 OVERALL ASSESSMENT AND SUMMARY

A review of all calibration and QC data reveals that system performance was adequate for the analysis of tritium. System performance in all data packages was acceptable, and the associated sample data are usable for all purposes.

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (pCi/g+-2)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B05WN8																				
Sample Number	B05WN8		B05WN9		B05WP0		B052P1		B052P5		B05WT8		B05WT9		B05WV2		B05WV3		B05WV4		
Location	116-H-9		116-H-9		116-H-9		116-H-3		116-H-3		116-H-7		116-H-7		116-H-7		116-H-7		116-H-7		
Remarks																					
Analysis Date	7-30-92		7-30-92		7-30-92		7-30-92		7-30-92		7-30-92		7-30-92		7-30-92		7-30-92		8-04-92		
Analytes	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
Gross Alpha	4.9	R	3.2	R	3.6	R	30	R	-1.7	R	2.1	R	4.7	R	5.8	R	4.9	R	3.2	R	
Gross Beta	15	J	9.7	J	12	J	15	J	14	J	18	J	110	J	160	J	22	J	19	J	
Uranium 233/234	N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		
Uranium 235	0.029	R	0	R	0.015	R	0.016	R	0	R	0.023	R	0.013	R	0.38	R	0.018	R	0.014	R	
Uranium 238	0.47	J	0.19	J	0.45	J	0.58	J	0.44	UJ	0.69	J	0.47	J	0.68	J	0.5	J	0.53	J	
Plutonium 239/240	0.004	UJ	0.024	UJ	0.004	UJ	0.006	UJ	0	UJ	0.026	J	1.1	J	1.3	J	0.073	J	0.003	UJ	
Americium 241	0.023	UJ	0.01	UJ	0	UJ	0.009	UJ	0.011	UJ	0.011	UJ	0.54	J	0.72	J	0.031	UJ	0.011	UJ	
Strontium 90	0.085	UJ	-0.18	UJ	-0.16	UJ	0.048	UJ	0.24	UJ	-0.15	UJ	3.2	J	0.93	J	-0.7	UJ	1.2	J	
Technetium-99	-0.13	UJ	0.23	UJ	0.17	UJ	0.52	UJ	0.2	UJ	0.15	UJ	0.33	UJ	0.095	UJ	0.26	UJ	0.22	UJ	
Carbon 14	-3	UJ	2	UJ	-9.3	UJ	3.5	UJ	1.8	UJ	-1.5	UJ	33	J	28	J	-8.1	UJ	34	J	
Potassium 40	15	J	11	UJ	11	J	9.8	J	8.8	J	7.2	J	19	J	33	J	14	J	11	J	
Chromium 51	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	
Cobalt 60	N/D	UJ	N/D	UJ	N/D	UJ	0.38	J	0.13	J	N/D	UJ	14	J	36	J	0.68	J	N/D	UJ	
Zinc 65	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	
Cesium 134	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	
Cesium 137	N/D	UJ	0.29	J	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	11	J	35	J	1.7	J	N/D	UJ	
Radium 226	0.64	J	0.71	J	0.5	J	N/D	UJ	N/D	UJ	0.29	J	N/D	UJ	N/D	UJ	0.65	J	0.44	J	
Thorium 228	1.2	J	1.1	J	0.73	J	0.58	J	0.45	J	0.41	J	N/D	UJ	N/D	UJ	0.81	J	0.46	J	
Thorium 232	0.75	J	1.1	J	0.39	J	0.44	J	0.57	J	0.41	J	N/D	UJ	N/D	UJ	N/D	UJ	0.44	J	
Europium 152	N/D	UJ	0.36	J	N/D	UJ	0.54	J	0.39	J	N/D	UJ	120	J	260	J	4	J	N/D	UJ	
Europium 154	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	19	J	37	J	0.5	J	N/D	UJ	
Zirconium 95	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	0.56	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (pCi/g+-2)

Project: WESTINGHOUSE-HANFORD																							
Laboratory: TMA																							
Case	SDG: B05WN8																						
Sample Number	B05WV5		B05WV6		B05WV8		B05WV9		B05WW0		B05WW4		B05WW5		B05WW6		B05WW7						
Location	116-H-1		116-H-1		116-H-1		116-H-1		116-H-1		116-H-1		116-H-2		116-H-2		116-H-2						
Remarks																							
Analysis Date	7-30-92		7-30-92		7-30-92		7-30-92		7-30-92		7-30-92		7-30-92		7-30-92		7-30-92						
Analytes	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q			
Gross Alpha	-1.3	R	4.9	R	6.4	R	0.86	R	2.7	R	2.7	R	3	R	1.7	R	3.2	R					
Gross Beta	110	J	95	J	92	J	69	J	16	J	-2.4	J	12	J	16	J	.14	J					
Uranium 233/234	N/A		0	R	0.53	R	0.62	R	N/A		N/A		N/A		N/A		N/A						
Uranium 235	0.031	R	0	R	0.025	R	0.13	R	0.05	R	0.043	R	0	R	0	R	0	R					
Uranium 238	0.61	J	0	UJ	0.31	UJ	0.23	J	0.39	J	0.58	J	0.33	J	0.54	J	0.5	J					
Plutonium 239/240	0.74	J	0.58	J	0.64	UJ	0.33	J	0.063	J	0.034	J	0	UJ	0	UJ	0.006	UJ					
Americium 241	0.2	J	0.16	J	0.16	UJ	0.068	J	0	UJ	0.006	UJ	0.004	UJ	0.002	UJ	-0.033	UJ					
Strontium 90	1.5	J	1.5	J	6.2	UJ	5.5	J	1.3	J	-0.081	UJ	-0.02	UJ	-0.76	UJ	-0.24	UJ					
Technetium-99	0.25	UJ	0.25	J	0.18	J	0.67	J	0.21	UJ	-0.76	UJ	0.14	UJ	0.084	UJ	0.42	UJ					
Carbon 14	2.3	UJ	3.4	UJ	8.9	UJ	-0.48	UJ	15	J	0.28	UJ	4.2	UJ	-0.21	UJ	0.91	UJ					
Potassium 40	13	J	9.9	J	13	J	13	J	10	J	13	J	8.9	J	12	J	13	J					
Chromium 51	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ					
Cobalt 60	2.5	J	1.8	J	2.2	J	2	J	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ					
Zinc 65	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ					
Cesium 134	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ					
Cesium 137	32	J	24	J	23	J	11	J	0.25	J	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ					
Radium 226	N/D	UJ	N/D	UJ	0.78	J	0.85	J	0.55	J	0.4	J	0.37	J	0.47	J	0.5	J					
Thorium 228	N/D	UJ	0.95	J	0.52	J	0.44	J	0.75	J	0.4	J	0.49	J	0.5	J	0.63	J					
Thorium 232	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	0.89	J	0.4	J	0.35	J	N/D	UJ	N/D	UJ					
Europium 152	54	J	36	J	34	J	42	J	0.72	J	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ					
Europium 154	5.4	J	3.6	J	3.6	J	3.6	J	0.34	J	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ					
Zirconium 95	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ	N/D	UJ					

RADIOCHEMISTRY ANALYSIS, WATER MATRIX, (pCi/L+-2)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B05WN8																				
Sample Number	B05WP7		B05WV1																		
Location	116-H-3		116-H-7																		
Remarks	EB		EB																		
Analysis Date	7-30-92		7-30-92																		
Analytes	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
Gross Alpha	-0.24	R	0.095	UJ																	
Gross Beta	-0.2	U	0.32	UJ																	
Uranium 233/234	0.54		0.013	R																	
Uranium 235	0.02	R	0.013	UJ																	
Uranium 238	0.56	J	0.022	UJ																	
Plutonium 239/240	0.008	U	-0.006	UJ																	
Americium 241	0	U	-0.019	UJ																	
Strontium 90	-0.25	U	-0.25	U																	
Technetium-99	0.79	U	1.7	U																	
Carbon 14	-18	UJ	540	J																	
Potassium 40	N/D	U	N/D	U																	
Chromium 51	N/D	U	N/D	U																	
Cobalt 60	N/D	U	N/D	U																	
Zinc 65	N/D	U	N/D	U																	
Cesium 134	N/D	U	N/D	U																	
Cesium 137	N/D	U	N/D	U																	
Radium 226	N/D	U	N/D	U																	
Thorium 228	N/D	U	N/D	U																	
Thorium 232	N/D	U	N/D	U																	
Europium 152	N/D	U	N/D	U																	
Europium 154	N/D	U	N/D	U																	
Zirconium 95	N/D	U	N/D	U																	

EB = Equipment Blank

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (pCi/g+-2)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B05WV7																				
Sample Number	B05WV7																				
Location	116-H-1																				
Remarks																					
Analysis Date	3/9/92																				
Analytes	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
Gross Alpha	3.7	R																			
Gross Beta	140	R																			
Sodium-22	1.78	J																			
Carbon-14	0.25	J																			
Strontium 90	5	J																			
Technetium-99	0.26	UJ																			
Uranium-235	0.0016	R																			
Uranium-238	0.13	R																			
Plutonium-239/240	0.71	R																			
Americium-241	0.077	R																			
Potassium-40	1	J																			
Cobalt 60	2.53	J																			
Zinc 65	0.8	UJ																			
Cesium 134	0.2	UJ																			
Cesium 137	36.4	J																			
Radium 226	3	UJ																			
Thorium 228	0.3	UJ																			
Thorium 234	3	UJ																			
Europium 152	51.4	J																			
Europium 154	4.9	J																			
Europium 155	0.5	UJ																			
Beryllium 7	1	UJ																			
Barium 140	400	UJ																			
Manganese 54	0.2	UJ																			
Cobalt 58	0.7	UJ																			
Cerium 141	6	UJ																			
Cerium 144	1	UJ																			
Iron 59	3	UJ																			
Zirconium 95	0.8	UJ																			
Ruthenium 103	3	UJ																			
Ruthenium 106	2	UJ																			
Iodine 131	100000	UJ																			

13.0 REFERENCES

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Date Received: 2-22-93 DS	**INFORMATION RELEASE REQUEST**	Reference: WHC-CM-3-4

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